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FLIGHT

1938

The AIRCRAFT ENGINEER AND AIRSHIPS

1549
XXXIV

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FLIGHT

The AIRCRAFT ENGINEER AND AIRSHIPS

FIRST AERONAUTICAL WEEKLY IN THE WORLD : FOUNDED 1909

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The Outlook

The "Royal and Ancient"

THERE was a time when it was the fashion in some quarters to refer to the Royal Aeronautical Society of Great Britain as "The Mutual Admiration Society." The sneer was partly deserved. In those days the authors of nearly all the papers read before the Society were either Air Ministry officials, technical people from Farnborough, or research workers from the N.P.L. The "discussions" were composed largely of flattering remarks by representatives of one of these sections about representatives of one of the other sections. Criticism of the papers there rarely was, and any attempt to point out that all was not quite as rosy as it was painted was usually frustrated in a most effective, but of course perfectly amiable manner.

That was long ago. Dissatisfaction led to the establishment of a "rival" body, the Institution of Aeronautical Engineers, and so great was the nuisance value created by the new body that in time it became necessary to do something about it. The result was an amalgamation of the two bodies under the short and snappy title, "The Royal Aeronautical Society with which is incorporated the Institution of Aeronautical Engineers." On the whole, the amalgamation has been beneficial, and there has been a marked improvement in the papers read before the Society. The academic atmosphere which previously pervaded the meetings gave place to one in closer touch with realities, lecturers were drawn from the industry, and the discussions became at times quite outspoken criticisms.

How it has come about no one seems to know, but old ideas die hard and it may be for this reason that the R.Ae.S. is still in the minds of the many the "Royal and Ancient" rather than the powerful force of advanced technical opinion which the Society's membership could and should make it.

Be that as it may, we are glad to welcome in our Correspondence page this week a letter from Mr. W. O. Manning, himself an ex-member of the Council of the Society, in which he calls attention to the strange absence of R.Ae.S. Members from various important committees and public bodies. We feel that this state of affairs has come about through thoughtlessness, and that it will be remedied once attention has been called to its existence.

Why?

DURING the last few years *Flight* has criticised, at fairly frequent intervals, the dilatoriness of the Air Ministry in issuing its reports on civil flying accidents. Fifteen years ago there was some reason for not saying too much about the causes of flying accidents. Often enough the causes themselves were rather obscure; frequently all on board lost their lives and it was difficult to establish reasonable proof of the sequence of events; engines were unreliable and ground organisation in the form of radio and meteorology non-existent; and there was always a very good chance that the manufacturers of aircraft and engines would be unjustly blamed.

Nowadays, however, flying accidents are fortunately rare in comparison with the number of passenger-miles flown, although frequent enough merely in point of time. Mechanical failure is a very infrequent occurrence, and the most common initial cause of modern accidents are weather conditions which would have been regarded a few years ago as quite impossible. Occasionally an error of judgment is responsible. In these circumstances there is no valid reason for delay in issuing reports on accidents.

Bearing all these things in mind, one would have expected that the official report on the accident to the Empire flying boat *Cygnus*, which took place in Brindisi Harbour on December 5, 1937, would have been issued long ago. The steward and one passenger were killed and the radio operator and five passengers were injured, but the pilots were unhurt and could give their version of what happened. Thus, there does not appear to be any very good reason why it should have taken more than eight months to issue a report which, when its circumlocutory phraseology is translated into simple language, merely means that there was no structural failure, the boat was not overloaded, but the instructions of the chief pilot to the second pilot about lowering the flaps were misunderstood and the flaps were fully lowered for the take-off, resulting in the boat porpoising. A repetition is not likely to occur; the pilots have had an experience which is of use to themselves and to all other pilots of Empire boats; no one's reputation was involved; so why the long delay? The cause was known at once.

R.A.A.F. Aircraft

THE announcement that the Royal Australian Air Force intends to adopt a British bomber of such an advanced type that it has not yet been issued to any squadrons of the R.A.F. must be gratifying to the whole Empire. It may be presumed that the selected type is meant to replace the Ansons now in use—that is to say, a twin-engined machine which can be used for coastal reconnaissance and for bombing.

Australia has to arm herself with particular reference to possible forms of attack on her enormously long coastline. Attempts by a foreign naval power to master the surface of the Pacific and Indian Oceans could only be countered by the Royal Navy, which the Royal Australian Navy would assist to the best of its power. Attempts at a hostile landing or a naval bombardment of Australian ports would have to be met in the first place by the aircraft of the R.A.A.F. That calls for an extensive reconnaissance organisation and a powerful striking force of bombers. The new British bombers which have been selected will be able to perform both these functions.

It would seem, however, that reconnaissance aircraft of extremely long range are also necessary, and that means flying boats. Their use introduces a new set of problems, for boats require certain facilities, and seaplane bases with sheltered water cannot be provided at innumerable spots on the Australian coast. The answer would seem to be large amphibians. At present there does not seem to be in actual production a type which would meet these requirements.

Of late Australia has been suspected of a prejudice in favour of American design. Such a feeling is certainly not universal. The R.A.A.F., at any rate, means to get the types best suited to its needs, and when Britain can supply those types then Australia will buy British.

The Long and Short of it

AN ingenious scheme for making possible the use of long, narrow strips of land as aerodromes is described in this issue. Briefly explained, the Maclaren solution is simply an ordinary tricycle undercarriage in which all three wheels can be set at an angle to the centre-line of the aeroplane, but with a usual degree of castoring freedom for the nose wheel.

Enthusiastic advocates of the tricycle undercarriage were fond of explaining that one could quite safely make out-of-wind landings with this type because as soon as the wheels touched, the machine would swing out of wind. They were quite right, but they forgot the rather severe momentary side load on the two rear wheels at the moment of touching-down with drift on.

Mr. Maclaren claims that if the pilot obtains his drift before he lands, and sets his wheels in accordance with the angle of drift, he can touch down with no unusual loads on the undercarriage, and the machine will "crab" along the runway or track, its path being parallel with the track, although its nose is pointing off to one side. It seems possible that he is right, although the feeling must be rather frightening until one gets accustomed to it.

More complicated, because of the airscrew thrust, is the take-off problem. With the wheel angle chosen to approach the angle of drift at the moment of take-off, the airscrew thrust must impose an initial side load on the undercarriage when the machine begins to move, but it is probably true that this is nothing like as great as that encountered by the rear wheels of the normal tricycle undercarriage at the moment of touch-down.

Certain it is that if the various problems which are bound to arise *can* be solved, the Maclaren idea would go a long way towards the ideal of long, narrow strips of land used as aerodromes. He believes that a width of 300 yards would suffice, and if that is so the preparation of a strip one mile long would not be anything like such a hazardous undertaking, financially speaking, as the present laying-down of municipal aerodromes measuring 1,000 yards in all directions. In fact, a strip one mile long and 300 yards wide would be only about one-half the area, with the advantage that the take-off run was nearly doubled in length.

Cyprus

THE agreement with Italy, which is not to come into force until foreign volunteers have been withdrawn from Spain, provides that neither party shall increase its fortifications in the Mediterranean, or at least something on those lines. Such an agreement is, of course, a relief to the taxpayers of both countries, and they are heavily taxed already. Presumably, this agreement has put an end to the fortification of the island of Pantellaria, which Italy had begun, and which would have threatened the passage of the narrow neck of the Mediterranean if an emergency had occurred. Great Britain, on the other hand, did not proceed with the proposed development of Cyprus as a naval and air base. Such a base would be very useful if Italy were to be regarded as a hostile Power, but as it is now recognised that there is no necessity for the two nations to be at loggerheads in the Mediterranean, and as the sentiments of both peoples have always been amicable towards each other, we are very glad to be spared the expense of going on with the Cyprus plan.

Still it is only common sense to keep Cyprus in mind, not as a base against Italy, but on general principles; and it may be noted that the G.O.C. of Egypt and the A.O.C., Middle East Command, have both gone to Cyprus on a visit. It is the duty of senior officers of all fighting Services to be constantly preparing for all and every eventuality, and periodic inspections of Cyprus are certainly most desirable. The island is a huge undeveloped possibility, and questions quite other than the Mediterannean question may some day make it desirable for the Navy and Air Force to use it as a base.

The Last Straw

EVERYONE will sympathise with the De Havilland Aircraft Company in the considerable writing-off of the Albatross monoplane last Saturday. So much time and thought and money have been expended on the development of this very advanced type of aeroplane that it seems very unkind of fate to provide this setback just at the end of the very exhaustive series of tests. The one redeeming feature of the mishap is that it happened as it did, with no personal injuries to anyone, and not while the machine was flying. Had that happened, the occupants might have been killed, the machine would probably have been burned completely, being entirely of wood construction, and there would have been no evidence as to the exact cause.

As it is, the company has all the evidence available, the cause of the failure in the fuselage structure is understood, and steps are being taken to prevent a recurrence in the production machines.

The sequence of events which culminated in the breaking of the fuselage when the machine had almost come to a standstill after landing is described elsewhere in this issue by a member of our Editorial staff who happened to be present. The point to bear in mind is that, after tests with gradually increasing loads, the machine had taken off three times with an overload 3,000 lb. in excess of its C. of A. gross weight, and had landed twice. Not until the third landing did the fuselage give way.

It is, of course, quite obvious that in ordinary commercial service no aeroplane would be asked to take off and least of all land repeatedly with such a big overload, and the tests were designed to discover any weak spots there might be, very much as the motor car manufacturer puts his new model through the most severe trials on track and road, subjecting it to conditions far more strenuous than any which the car would meet in ordinary usage.

DIARY OF FORTHCOMING EVENTS—PAGE 191

The main difference is that the car manufacturer can carry out his tests in secret. If anything breaks he repairs or replaces the offending component, probably takes the opportunity to strengthen it, and no one is any the wiser. With a modern aeroplane, which requires a large aerodrome, privacy is next to impossible, and when anything goes wrong the world knows about it. But, fundamentally, there is no more damage to the De Havilland reputation than to that of the car manufacturer.

Civil Aircraft and Belligerents

THE shooting-down of a civil aeroplane by a pilot of the Japanese Flying Corps shows the need for international agreement on rules for aircraft in war. Mr. J. M. Spaight, in his book *Air Power and War Rights*, concludes that if belligerents have issued a warning they may fire on a civil aircraft which is approaching their bases, lines of communications or zones of military operations. Firing on the occupants of such an aeroplane after it has landed and when they have left the machine and are trying to escape is quite another matter, and that is what the Japanese are said to have done in this case.

A pilot of a belligerent aircraft is in a difficult position when dealing with people escaping on the ground, or, as in this case, swimming away in the water; for if they should be spies trying to get valuable information to the enemy, he is not able to arrest them as ground troops would be able to do.

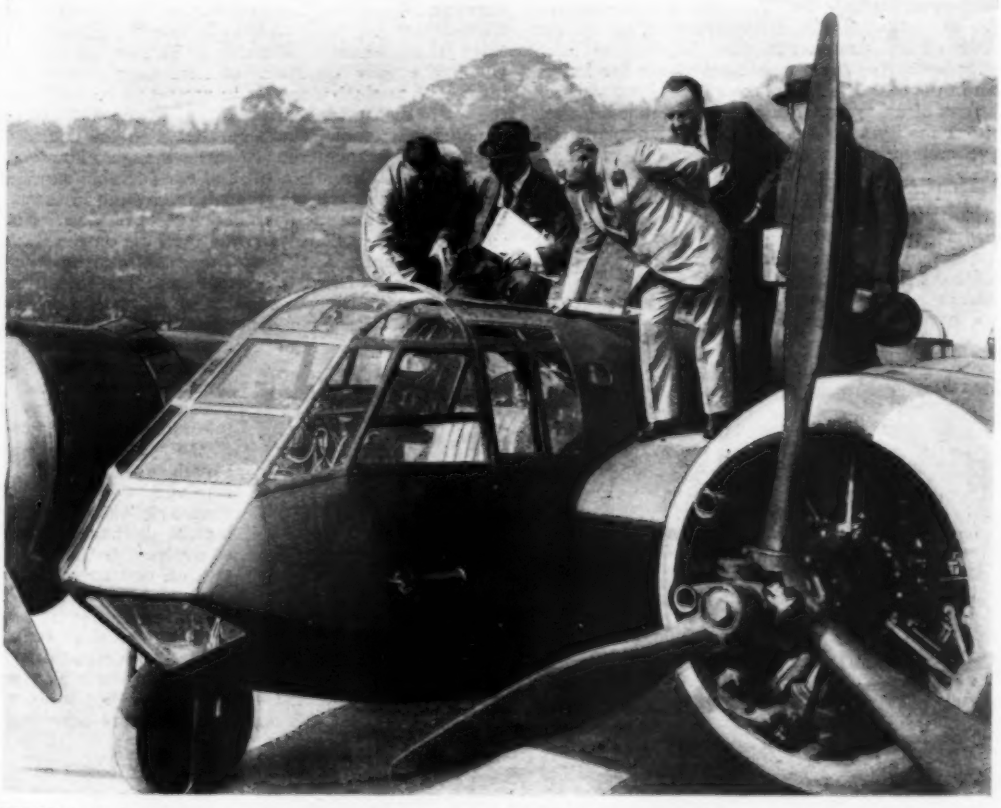
So far as the circumstances are known here, there was no reason for this particular pilot to have made any such assumption, and this case seems on the face of it to be much on a par with the wounding of the British Ambassador to China in his motor car, which occurred some months ago. Such cases give the impression that some Japanese pilots find their fingers itching on their triggers, and are not too careful of what they fire at so long as they enjoy the fun of letting off their bullets.

"Twin" Fighters in Service

THE free interchange of information between the Air Forces of Great Britain and France must be proving particularly beneficial to the R.A.F. now that France is getting her new twin-engined fighters into service. Any similar machines which may be under construction in this country are secret and are not likely to be in general use for some months to come, so we may be thankful that France is able to set about evolving suitable tactics for her graceful Potez monoplanes, and that she is paving the way for the adoption of this radically new class of machine by the R.A.F.

If the Air Ministry follows French practice and accentuates forward armament, be it of the fixed or semi-fixed type, methods of attack are not likely to differ greatly from those developed for the Hurricanes and Spitfires. But the Ministry is manifestly partial to power-driven turrets, and it may be that these will be exploited in the new "twins," to the horror of Mr. Golovine, part-author of that monumental work *Air Strategy*, who insists that these turrets were dead before they were born.

Unfortunately, the tests with the new French fighters will throw little light on the turret question, because the rear guns have manually operated mountings with a limited arc of movement Nevertheless, operation of the Potez during the next few months should produce plenty of welcome data. One thing seems certain: engines of much higher power will be needed in subsequent designs, for with thirteen hundred horse-power the performance of the Potez is little or no better than that of the Blenheim bomber.



MINISTERIAL INTEREST: Sir Kingsley Wood and Sir Edward T. Campbell inspect a Blenheim during a visit last week to the Bristol factory. The group includes Mr. H. J. Pollard (works manager), Mr. W. G. Verdon Smith (chairman), Mr. H. J. Thomas (assistant managing director), and Mr. W. A. Fernie (sales manager). This photograph, incidentally, gives an intimate view of the Blenheim's nose and one of the 840 h.p. Mercury VIII engines.

STRIP AE

—*A Practical Possibility? Points in Favour of the Maclaren "Crabbing" Undercarriage : Solving the Runway Problem : Successful Initial Experiments*

NOWADAYS the problems of aerodrome size and surface are taking on a very special importance. Many years ago it was considered that an area of, say, 800 yards square was sufficient for all normal purposes. To-day the accepted idea of an unobstructed runway suitable for future conditions is getting on towards 2,000 yards—and this distance, or something like it, must be available in all directions.

Quite apart from the technical difficulties involved in finding suitable areas of such dimensions within reasonable distance of the big commercial centres, the cost of buying and levelling such sites is increasing out of all proportion to the financial importance of air transport. In the meantime commercial machines are gradually becoming larger and heavier, and mere length of unobstructed runway will presently be no more important than the surface of the runway.

For these and other reasons transport operators are looking to the flying-boat for developments in really large sizes, the principle being that, in theory at least, the necessary take-off and landing runs can usually be obtained on water. At the same time this type of machine begins to show very definite advantages in the relation between structure-weight and load capacity when the size is increased beyond that which is at present considered usual. Furthermore, the larger the boat the more seaworthy it can become, and it is no longer necessary to operate only in sheltered waters.

Landplane Points

But, unfortunately, it is not quite as simple as that. Apart from the fact that it is inconvenient to operate any but long-distance services, such as those of Imperial Airways, by such means, the question of relative drag at take-off speeds becomes increasingly difficult as wing-loadings go up. Even when a boat is on the step this drag is considerably greater than that of a land undercarriage—a fact which not only provides a limit to wing and power loadings, but which also means that the engines must always be made to give their maximum power for longer periods than in the case of a landplane. Additionally, there is the slight risk of unseen obstructions in the take-off area.

So, whatever the flying-boat's virtues, the landplane will always have certain advantages and any way in which aerodrome size and surface difficulties can be overcome demands careful consideration.

The tricycle undercarriage, by itself, has probably given the idea of a really large landplane new possibilities, and it is significant that the largest civil aircraft manufacturers in the world have fitted this type of undercarriage to their latest production. Within limits the conventional tricycle—that is, one in which the centre of gravity is forward of the main wheels—provides a certain degree of latitude in the choice of take-off and landing direction. A machine with such an undercarriage is very stable directionally and it is possible to land it slightly across wind without serious difficulty; the touch-down, however, involves a sudden swing to line the machine up with its previous flight path.

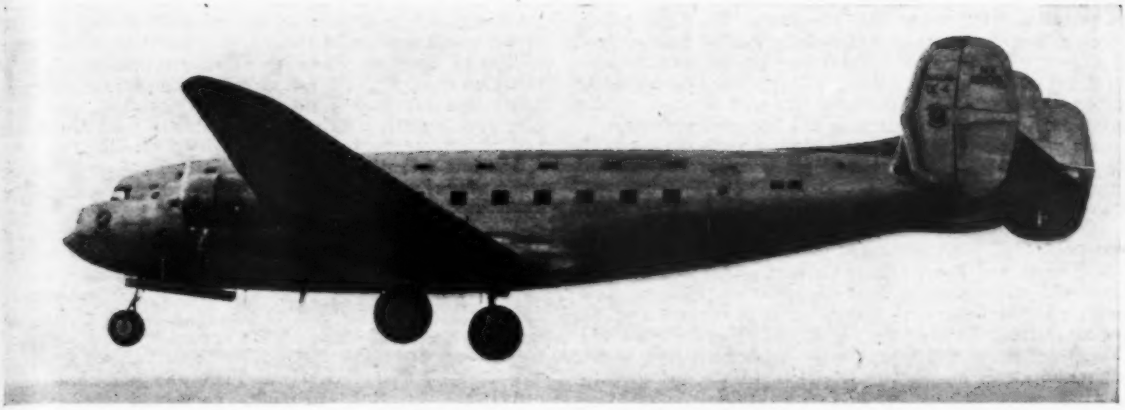
The ideal is a type of undercarriage in which all normal take-offs and landings can be made in one or two directions on a single strip. In such circumstances it would be possible and reasonable to lay out such strips, the cost of which would be very much less than the aerodromes at present required. It would become an affair of practical politics to carpet this comparatively small area with a surface which would be capable of taking the considerable loads which are now being imposed. Neither financial nor geographical considerations would prevent such a strip from being as reasonably long as the operators require. Thinking financially it is interesting to discover that a 300-yard-wide strip could have a length of nearly two miles while still covering the same area as a square aerodrome with only 1,000-yard runs.

It would seem that the only method of achieving these characteristics in an undercarriage is to arrange it so that the machine can be "crabbable" on the ground (i.e., all three wheels shall be steerable). This is the principle on which the new Maclaren undercarriage operates. The inventor's original idea was to arrange a control by which the angle of the three wheels (that in the nose, of course, remaining steerable) could be altered in the course of the landing and take-off run. A little thought, however—and Mr. O. F. Maclaren is a pilot of considerable experience—showed that this scheme, though interesting in theory, was not practical from the operational point of view. Not only would it be difficult to keep the machine on the track, but such an arrangement would give an already over-busy transport pilot at least one more control to look after.

On calculation it was found that a single selected angle for all three wheels could be used more satisfactorily, this angle being calculated and set before making the approach, or when actually in position on the runway before the take-off. The calculation of the angle would be a very simple one, and the work involved would be entirely similar to that of estimating normal drift at an air speed equivalent to that of the take-off or touch-down of the machine.

On the face of it, it might be imagined that during the take-off the correct drift angle would vary from a very wide one at the beginning of the run to a very narrow one at

The Arpin pusher on which the experiments are being carried out with an undercarriage which is directionally adjustable on the ground. In actual practice the degree of "crab" will be adjustable from the pilot's seat



Typical of the kind of machine for which the Maclaren undercarriage is intended. The new Douglas D.C.4, which already has a tricycle landing gear and is the largest machine so fitted—a very courageous experiment in itself.

AERODROMES—

the moment of leaving the ground. In fact, the effect of the airscrew thrust upsets all such simple calculation. This force tends to cancel out the wind effects during the run and helps to make a fixed angle a more practical and reasonable proposition.

According to the characteristics of the machine the undercarriage might be set at different angles to suit the take-off and landing. For instance, a setting of 15-20 deg. would be theoretically correct in a 30 m.p.h. wind broadside to the track for a take-off speed of 75 m.p.h. when allowance has been made for the effects of side area and airscrew thrust. During a landing at the same speed, in which this thrust need not be considered, the correct setting would be about 23 deg. In practice the same angle would be used for both, and it seems that a maximum lock of 30 deg. would be ample for any machine other than one with very low minimum flying speeds.

Operational Points

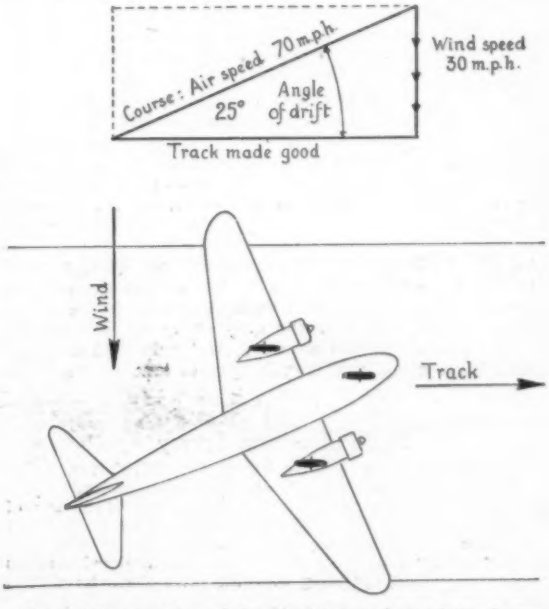
In order to obtain the best results, particularly on wet or icy surfaces, a slight modification of the usual take-off methods would be necessary. At present the pilot has to obtain the maximum possible acceleration, but with the Maclaren undercarriage any really violent increase of thrust at the start of a run would naturally apply considerable side loads on the undercarriage, since the line of thrust is not parallel with the line of travel. Such caution would not tend to increase the actual take-off run by very much, though the time would naturally be longer. One incidental advantage of less violent acceleration (and longer runways) would be that aero engines would have a longer life; practically all the wear in the engines of modern transport aeroplanes seems to take place during that initial over-drive period when the engine is being made to give much more power than is ever required in normal operation.

Although, as has already been explained, a cross-wind take-off can be made with a conventional tricycle, the side loads are very great just at the moment of leaving the ground, and in strong winds would be very difficult to control. With the Maclaren undercarriage any side loads consequent on over-violent acceleration are greatest at the lower end of the ground-speed range when wheel adhesion is at its maximum, and these loads, if the correct angle is applied, disappear entirely once the machine is properly under way. In the same manner a conventional tricycle can also be landed across wind, but here again the side loads at the moment of touch-down are considerable, and even if the undercarriage will take them and the machine remains on the track, the effect would be uncomfortable for passengers sitting well aft of the undercarriage and would alter the readings of all the gyroscopic instruments.

In bad weather conditions this instrumental effect during the landing might be of small account unless it was found necessary to open up and go round again, but during the take-off it might be quite impossible to keep the machine headed in the correct direction. On slippery surfaces, too, it would begin to drift badly long before it was properly airborne.

In theory it is obvious that, with the "crabbable" undercarriage, the take-off run in a cross-wind will always be less than that of a conventional tricycle undercarriage in similar or flat calm conditions. In practice it is possible that the effect of off-line thrust would cancel out this small advantage.

There is another aspect of the principle which is worth special consideration. The possibility of engine failure immediately after the take-off must always be remembered, and with modern transport and military types very few aerodromes are available at which the runs are sufficient



The simple operation of the Maclaren undercarriage shown in its basic principles. Above is a conventional vector diagram in velocity parallelogram form with the diagonal as the angle of drift and the base as the track made good in a 30 m.p.h. side wind at an air speed of 70 m.p.h. In the sketch below the same drift effect is shown with a conventionalised machine. The wheels are merely adjusted so that the machine can continue without swing down the strip at the touch-down drift angle. The front wheel remains steerable for incidental course corrections.

to permit a "follow-through" landing. Until the undercarriage has been retracted few fully loaded twin-engined machines, with the best take-off flap setting, can continue to climb on one engine. With the length of runway which becomes a practical possibility in the case of strip landing grounds, an immediate landing will always be possible.

According to present ideas a width-margin of 300 yards is necessary to allow for directional errors during a blind approach. The strips which are visualised, therefore, will be of this width, and as far as blind approaches are concerned the Maclaren undercarriage should certainly simplify the procedure. In conditions of fog there is very rarely much wind and the landing can be made straight off the approach. By far the most dangerous conditions, however, are those in which heavy snow is falling, with the accompaniment of a strong wind and, perhaps, low cloud. Although the ground may eventually be seen from a safe direct approach height, this height is still not sufficient for the pilot to make a half-circuit before turning into wind after he has found the aerodrome at the end of the blind approach line. With the Maclaren undercarriage the machine would come down the beam in the ordinary way, after runs have been made along this line in order to correct the drift on the directional gyro, and the wheel angles would already be set for the drift effect at touch-down speed.

Long-Range Possibilities

For very special long-range work, whether with civil or military machines, the practical use of strip landing grounds offers considerable advantages. Concrete tracks could be arranged at no great cost and with no greater technical and geographical problems than those involved in the layout of a modern arterial road. For such work these tracks could even be arranged at a considerable gradient so that a heavily loaded machine would have the advantage of this incline in the take-off acceleration. Any machine with a sufficient margin of power to fly at all could be got in the air safely and without the need for any form of assistance. Take-off analysis shows that with a gradient of 1 in 10 a level run of 400 yards is reduced to a little less than 250 yards. With all present schemes for assisted take-off, the heavily loaded machine becomes, so to speak, an orphan once it is airborne. With the steerable undercarriage the machine is carrying its own take-off assister.

Less important, perhaps, are the possibilities in the training and light aircraft field. The device would, however, permit the use of aerodromes which are small in overall area, and these strips could, therefore, be provided fairly cheaply within population centres. Even the overhead city airport, long considered by academic enthusiasts, becomes a more reasonable proposition. The track in this case need not even be opaque, but could be constructed, for instance, of light steel mesh so that some light was permitted for the unfortunate mortals living below.

All Mr. Maclaren's initial experiments are being carried out with the Arpin pusher, with the collaboration of its designer. This machine lent itself admirably to the work, and is, in fact, probably the only really suitable one at present available in this country. Not only is it designed around the conventional tricycle type of landing gear, but the undercarriage fittings are exceptionally robust, and the whole machine may be treated as a convenient miniature edition of those to which the Maclaren undercarriage is intended to apply. At the moment, the prototype Arpin, which was described in *Flight* of November 25, 1937, and May 12 this year, is fitted with a Salmson engine, but this unit may presently be replaced by a Cirrus Minor.

The first serious test work was carried out on a day on which the ground wind-speed was probably as high as 25 m.p.h.—at any rate, ordinary light aeroplanes were unable to leave the hangars, and even more heavily loaded Service types could only be taxied with the ground staff at the wing-tips. The scene of the experiments is Luton airport, where there is ample area and insufficient general flying to cause really serious delays. Both take-offs and landings made broadside to the strong wind were carried out without difficulty, and neither from the pilot's nor the passenger's point of view was there any sensation of insecurity. The only difficulty concerned the taxying process, which was done of necessity with the undercarriage wheels still at the correct cross-wind angle, since the Arpin is fitted with a temporary arrangement for experimental purposes. The three wheels are, of course, adjustable on the ground to an angle suitable for prevailing conditions, but the machine must be taxied out and back in a somewhat difficult directional attitude. Incidentally, there is no reason at all why the Maclaren principle should not be applied to the ordinary undercarriage or to the B.L.G. type of tricycle.

Angle Adjustment

In practice the angle adjustment will be made from the pilot's seat, so that this angle can, therefore, be altered according to the pilot's own calculations. All he will need, knowing his own landing speed, is the prevailing direction and speed of the wind at ground level. Alternatively, and particularly in bad weather conditions when he would be otherwise employed, this angle could be worked out for him by the ground staff and given to him by radio in the same way as that in which barometric pressure is provided for altimeter adjustment before starting a blind approach. The suggested angle indicator might take the form of a horizontally mounted needle moving against a degree scale, and in weather conditions in which the ground can be seen the undercarriage angle will be adjusted until this needle is pointing in the direction of actual travel while the machine is crabbing across wind down the line of the landing strip.

Directional control is provided by a steerable and castering nose wheel in the ordinary way, though the neutral position of the wheel is, of course, set with a bias similar to that of the main undercarriage wheels. Except for the fact that the machine itself is not travelling in the fore and aft axis of the fuselage, there should be nothing very difficult or strange about the ground control.

It is impossible to be merely indifferent about this device, which is being handled by the Maclaren Undercarriage Co., Ltd., of 1, Oxford Court, Cannon Street, London, E.C.4. Either it is extremely important or it is of no practical interest whatever. H. A. T.

South American Survey

IN the course of an address before the British Society in Buenos Aires, Mr. W. D. Roberts, who is leading the British Airways mission in South America, explained some of the difficulties involved in planning a service to West Africa and across the Atlantic to South America. These difficulties are particularly noticeable when other international services have already been operating over the same route for several years.

The service not only has to be operated through foreign countries, but a decision has to be reached concerning the type of machine, whether landplane or flying-boat, to be used, and a complete system of radio and meteorological facilities has to be arranged over the entire route.

The very fact, he explained, that other companies had already provided practically all their own organisation made it specially necessary for British Airways to evolve an equally efficient or even better system. He said that the task of the mission had been materially assisted by help both from the British community and the Argentine Government, but it was at present impossible to say exactly when the service would start. In the course of his remarks Mr. Roberts said that the Argentine Government had recently decided to construct a really up-to-date central airport for Buenos Aires.

The New LeO

THE prototype of the series of six Lioré et Olivier 24-6 flying boats which have been ordered by Air France for use on their Mediterranean services is now ready for tests at Etang de Berre. This machine was recently damaged during take-off and has been undergoing repairs. It made its first flight on September 30, 1937.

It will be remembered that Air France intend to re-equip their Mediterranean fleet with these 26-passenger 200 m.p.h. flying boats. Four Hispano 12 X i engines of 690 h.p. are placed in line along the leading edge of the wing. The all-up weight of the new LeO is 13 tons, and a crew of four will be carried. The range is 700 miles; cruising speed 160 m.p.h

THE FOUR WINDS

ITEMS OF INTEREST FROM ALL QUARTERS

ON Wednesday of last week, Flt. Lt. J. H. G. Sarll, R.A.F., was married at Hamble to Miss Phyllis Dorothea Verdon-Roe, daughter of Sir Alliott and Lady Verdon-Roe.

Owing to popular demand, Railway Air Services have decided to extend the London-Belfast-Glasgow summer-time service until September 10. Originally, it was intended to withdraw the service on September 3.

A batch of 16 Hawker Harts—part of a consignment of 100 obsolescent machines bought from the British Government at £200 each—has arrived at Johannesburg. These machines are destined for the South African Air Force.

The new Central Airport, Moscow, which was opened last month, lies almost in the centre of the city. It is equipped with concrete runways, some 300ft. in width. The new airport serves as a base for Russia's only air transport link with Western Europe.

Twenty-five Years Ago

(From "Flight" of August 30, 1913.)

"It may be worth while to draw attention to a humbler field in which invention is very much needed. This is the discovery of some suitable substitute for steel wire for hydro-aeroplanes. Even something that would rust away in a leisurely fashion would be a discovery of very great value. . ."

THE STATUE OF LIBERTY appears to wave a greeting to an American Airlines Douglas DC3 as it flies past Bedloe's Island, outside New York Harbour. The famous figure is to have an extensive overhaul, inside and out, in preparation for the World's Fair.

It is reported that the Dutch East Indies Government, in renewing the concessions for K.N.I.L.M., has insisted that the activities of the company shall be controlled from the East Indies.

IRAQ STUDIES BRITISH TRAINING METHODS: Capt. Madhat Abduk Rahman, chief instructor of the Iraq Air Force Training School, is over here to study typical R.A.F. Reserve and Volunteer Reserve organisation. He is here seen with Flt. Lt. C. A. Pike, at the De Havilland School of Flying at Hatfield, where, incidentally, he conducted the acceptance trials of three new D.H.89s for Iraq.

The Gota works in Sweden has just delivered the first of its machines fitted with the Le Blond engine. The new machine which has a cruising speed of over 105 m.p.h., is modelled on the lines of the American Rearwin Sportster two-seater.

Lihou, a small island off Guernsey, is for sale. This fact is announced by a large sign with five-foot letters painted in whitewash in its only field. It is designed to attract attention of passengers on the Jersey-Exeter route, on which the island lies.

Reports from the U.S.S.R. state that a new automatic parachute release has been designed for use on passenger aircraft. It appears that the mechanism can be set according to requirements and at the same time does not interfere with manual operation of the rip-cord should its use be necessary.

The New Zealand Prime Minister, Mr. Savage, has announced that his Government has signed an agreement with Union Airways undertaking the formation of a company to operate a trans-Tasman Sea air service. The intention is to operate a triangular service between Sydney, Auckland and Wellington.

A Northrop Delta and an Aeronca are are on board the Norwegian ship, the *Wyatt Earp*, now en route for the Antarctic. They form an essential part of the equipment for Lt. Cdr. Ellsworth's and Sir Hubert Wikins' joint expedition to explore Enderby Land. The Northrop will be used as a base while communication with the ship will be maintained by the Aeronca.

CORRESPONDENCE

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.

UNDER WAY: The Civil Air Guard honorary commissioners and hon. secretary assembled at Ariel House last Monday for their first meeting. Left to right: Mr. Robert Murray (Scotland), Lord Londonderry (Chief Commissioner), Air Comdre. J. A. Chamier (hon. secretary), Capt. Balfour, Mrs. F. G. Miles and Maj. Alan Goodfellow.

THE ROYAL AERONAUTICAL SOCIETY

Its Place in the Scheme of Things

AS an old member of the Royal Aeronautical Society I am naturally desirous that this Society should obtain that amount of prestige to which it is entitled as the senior technical body of a great and growing industry and that it should take its place as an equal among the sister societies and institutions of other branches of engineering.

At present, the chief function it undertakes is the holding and publishing of lectures and discussions, and, although it is doing excellent work in this direction, I suggest that this is not enough and that it should insist on being recognised as the premier authority on aeronautics in this country.

One obvious way of doing this is for the Society to be represented by its own appointed nominee on the various committees of public bodies which deal with aeronautical matters. At present it seems that if technical aeronautical advice is wanted on such committees it is not obtained from the Society in the way that similar engineering information is obtained from the Institutions of Civil, Electrical and Mechanical Engineers.

Take, for instance, the National Physical Laboratory. The aeronautical laboratories there are among the best known in the world and form an important and growing section of its activities. But, although the Institutions of Civil, Electrical and Mechanical Engineers have each their accredited representatives on the General Board of the N.P.L. the Royal Aeronautical Society is ignored completely.

The same thing is true of the Universities. Aeronautical subjects are being introduced freely into the syllabus of these bodies and while it is desirable that this tendency should be encouraged and that every University should have facilities for aeronautical research, there is not a University Court in the country which has an accredited representative of the Royal Aeronautical Society, though representatives of contemporary bodies can be found in many of them.

Again there is no Government Committee on which a Royal Aeronautical Society representative sits, though members of other societies and institutions may be found on them. The Society was certainly once represented on the Aeronautical Research Committee, but this representation lapsed some years ago. Even the Air Registration Board, which is a technical body dealing entirely with aeronautical matters has no Royal Aeronautical Society representative, though it has a representative of the Royal Aero Club and of the public.

It is also curious that while some of the other important institutions are represented on the Home Office sub-committees on Air Raid Precautions, the Royal Aeronautical Society is not. Apart from the fact that if aircraft did not exist there would be no need for the committees, can it be said that the technical advice of the Society would be otherwise than invaluable on this subject?

It would be possible to give many other instances of the way the Royal Aeronautical Society has been ignored in official and other circles, but the above will suffice for the present purpose.

But it is obvious that the present position of the Society with regard to these matters is intolerable and that steps should immediately be taken to put matters right. In the belief that wide publicity is the best medium for the treatment of ills of this nature I venture to ask you to publish this letter.

London. W.1. W. O. MANNING.

C.A.G. HEART-CRY

Ousting the Club Member?

SEEING that everybody is on the defensive regarding the C.A.G., may we enter the lists on behalf of our members who are not of the "idle rich" class, but whose average earnings are about £3 per week? Their enthusiasm has been such that, in this club, members have been flying for the past four years.

It appears that our members, and others who have spent all their spare cash to get pilots' tickets, are now to be ousted by "something-for-nothing" people who will collar the 'planes now that it does not mean cutting out the cinema, etc.

All who have learned to fly in the past have cheerfully taken the risk of being conscripted as pilots in time of need (all pilots know that their flying history is tabulated at the Air Ministry). Surely these deserve more consideration than those who have to be bribed to do so? R. T. DEW, Hon. Sec.

London, W.C.2. Civil Aviation Service Corps.

TIGER MOTHS IN RHODESIA

Performance at Altitude

WE feel we should comment on a letter published in your issue of August 18, page 147, which gives "some impressions" on the performance of aircraft in Northern Rhodesia, with particular reference to the Tiger Moth. Although your correspondent is drawing attention to local climatic peculiarities the effect of his letter is to suggest that the performance of the Tiger Moth in given conditions is greatly inferior to the performance actually achieved by this aircraft.

Your correspondent writes that from an aerodrome at 4,100ft. and in an air temperature of about 75 degrees the Tiger Moth, with two occupants, required "about 500 yards" to take off. He does not say whether the aircraft had a full tank. We are able to state that the take-off run (in a wind of 5 m.p.h.) with full load (two pilots, parachutes, full 19-gallon tank, complete blind-flying hood and equipment—making 1,750 lb. all-up weight) is 250 yards at that altitude and air temperature.

He writes that the aircraft would not climb beyond 2,000ft. above the aerodrome, whereas we are able to state that the climb with full load at 6,100ft. at 68 degrees F. is 400ft./min.

He says that 1,000ft. was lost in the first half-turn of a spin. It is not possible to estimate what atmospheric conditions were on that occasion but official tests have verified that in standard atmosphere only 230ft. is lost in a whole turn.

More than seven hundred Tiger Moths are in world use and several hundred are on order for important users. The performance and qualities of the type are thus well established. A number of Tiger Moth schools are located in the tropics and at altitude. The performance, even in these unfavourable conditions, is universally applauded.

An example which comes to mind is the large school organised some years ago by the Imperial Iranian Air Force at Teheran, at an altitude of about 4,000ft. The work here proceeds throughout the year and exceedingly high air temperatures prevail in the summer months. Many other instances could be quoted. F. N. ST. BARBE.

The De Havilland Aircraft Co., Ltd.,
Hatfield, Herts.

COMMERCIAL AVIATION

"Flight" photograph.

READY: Imperial Airways should very shortly be taking delivery of the first of the fourteen A.W. Ensigns, which appear to be well up on contracted performance and payload. This is a photograph of the first of the series taken on an early test flight.

THE WEEK AT CROYDON

"TarMac" Temporarily Takes Over and Writes About QBI and Control Officers' Salaries, Excavations, Air Raids and Other Things

AROUND this time of year "A. Viator" drops his pen, and with Ella Viator and their son D. Viator ballasting the family chariot, he sets out on vacation. I say "sets out" because he, probably no more than I, has no ghost of a notion as to their ultimate destination, except that their *Volkswagen* is headed west, and, like so many other airport conveyances, it probably knows the road Devonwards by heart.

I read in *Flight* last week that a gent.—or so one must assume, since the correspondence is over the pseudonym of "Operator"—has at last been so bold (following editorial comment of the previous week) as to instance some of the strange goings-on that have lately been noticed under QBI conditions. Of late many have ceased, as they used, to revere the letters QBI because, alas! they do not always appear when such conditions prevail. Sometimes, after setting out on a compass course for the foot of the control tower, and colliding with all and sundry, an engineer is surprised to find that this delightfully artistic sign is not illuminated. More often than not we learn that "Met" say, in accordance with their report of an hour ago, that conditions of poor visibility *cannot* prevail and so there's an end to it. Seems a pity that "Operator" chose to remain anonymous, but possibly he thought that those in Control might in future bear him a grudge, whereas in point of fact any airline pilot will tell you that the British control system is the most unbiased extant.

Definition Wanted

The point is that we *must* get down to the question: "What *are* QBI conditions?" At the moment there is too much variation of opinion on this important matter. One thing is certain, QBI is always going to mean inconvenience for *someone*, and it would seem imperative that operators, pilots, control officers, and others directly concerned, should get together with a view to arriving at greater unanimity on the matter.

Arguments put forward to suggest that the Controlled Zone scheme is faulty are that the actual area concerned is too large; that nothing will deter pilots, commercial and more especially private, from having a crack at entering QBI areas without permission until a system of fines can be instituted—*and* payable on the spot; that the present qualifications for the highly responsible and specialised post of control officers are inadequate; and, lastly, that if the really experienced type of man is to be attracted to the control service, then the present salaries offered to candidates, as pointed out by *Flight* in its comment, are far from adequate.

Expressing my purely personal opinion, I think that the last-named argument more nearly reaches the root of the present unsatisfactory position. Very QBI, no doubt, but one hopes that officialdom will not frown upon the idea of control officers giving their views on this interesting subject in the appropriate pages of *Flight*.

Secret Service

Our excavations proceed apace and the levelling or gradation of our slope in front of the northern hangars must be a source of astonishment to Quirks and Guildings, who, of course, are only used to pick-and-shovel progress. We are assured that appropriate drainage facilities are being incorporated in this scheme; failure in this respect can but result in a call for amphibians with which to operate the winter newspaper services. However, the added space will be welcome, particularly if many more Service aircraft find their way to Croydon's "secret aircraft factory." Since "A. Viator's" recent discovery, the employees of this organisation are to be seen walking *backwards*, and when I passed the time of day with Rollingpin, the boss of this outfit, he said he's been having a lot of trouble with his car—a luxurious limousine, of course—as it has lately persisted in travelling in *reverse*. Drat that barbed wire!

Still we sing without our orchestra. I mean that unless I am very misinformed, we are still without our A.R.P.s at Croydon. True, unlike "A. Viator" who, I gather, is now an A.R.P. Professor, I have not pressed any enquiries as to how long after the declaration of hostilities (if any) we at Croydon are supposed to apply for our masks, but a visitor to Macadam Mansion in my remote village called with samples, tape and particulars to safeguard Mrs. TarMac and the hound against any Bad Smells likely to be thrust upon us. Of course I only hope our kind enemies give me time to travel the dozen odd miles home to fetch this useful little device in order that I may return to see what sort of a mess has been made of our airport, have a drink in the buffet and collect the possibly empty cash box.

TARMAC.

COMMERCIAL AVIATION (CONTINUED) : WORLD NEWS

British Airways' Fourteens

LAST Sunday two of the four Lockheed 14s which have been ordered by British Airways arrived at Southampton. They will be assembled at the airport there, and then be flown to the company's operational headquarters at Heston. Survey flights to Lisbon will be started as soon as the second two Fourteens have been delivered this month.

Rome-Baghdad

ALA LITTORIA, the Italian operating company, will shortly start a regular service between Rome and Baghdad, via Brindisi, Rhodes and Haifa.

On Thursday of last week a Savoia-Marchetti left Littorio airport, Rome, at 5 a.m. on the first experimental flight over this route. The flight was made in two stages in the outward direction, but the homeward run was to be made in one day. No passengers were carried.

And Now K.L.M.

SINCE the Portuguese Government has granted permission for K.L.M. to land at Lisbon and the Cape Verde Islands, it is to be supposed that the preparations for the suggested service between Amsterdam and the Netherlands West Indies will go ahead fairly rapidly. In all probability this South Atlantic service will be surveyed in sections, and it does not seem likely that it will be regularly operated until next year.

At present K.L.M. operate quite a number of important services in the West Indies, using Lockheed 14s as well as the Fokkers which have been out there for some considerable time. In due course these coastal services, which now connect La Guaira, Curaçao, Aruba, Maracaibo and Barranquilla, will be extended to Cucuta (Colombia), and to Port of Spain, Barbados and Paramaribo.

High-altitude Transport

LARGELY for eventual use on such services as that from Amsterdam to Rome, on which considerable operating heights are normally attained, K.L.M. have now taken delivery of the first consignment of Wright Cyclone G.105 engines. These are fitted with two-speed superchargers, and when the company's D.C.3s are fitted with them the machines will be the first transports in Europe to be equipped for serious operation at widely different altitudes. G.105 engines are at present used by Pan-American Grace Airways on their trans-Andean services.

In last week's issue we mentioned that Chandler Groves carburettors were being fitted to all the engines of K.L.M.'s D.C.3s, and examples of these accessories are already being installed. Certain machines will also be equipped very shortly with Hamilton hydromatic full-feathering airscrews, and unless British Airways' Lockheed 14s go into service before long, these will be the first of the type to be used in Europe.

Atlantic Postponement

WHILST being put through its overload take-off tests last Saturday evening, the second Atlantic Albatross broke its back. Two perfectly normal take-offs and landings had been made in the hands of the De Havilland Aircraft Company's chief test pilot, Mr. Geoffrey De Havilland, and it was not until the machine had completed its third landing run and was almost at a standstill that the fuselage structure collapsed immediately aft of the long-range tanks and across the point where the door is arranged.

In appearance there was nothing very unusual or disturbing about either the take-offs or the landings, though, with its 3,000-lb. overload, there was, perhaps, rather more noticeable flexing in the fuselage than is normally to be expected. Each landing with such a heavy load had been made quite deliberately on the wheels, and during deceleration there was a normal amount of fore and aft pitching, while it seemed that the main undercarriage legs as well as the tail wheel leg were bottoming under the heavy load. This last fact may possibly have had some bearing on the eventual failure.

After the third touch-down, which was certainly the smoothest of the three, the rear door suddenly opened—obviously, and with later knowledge, presaging disaster. While the Albatross was still travelling at, perhaps, 20 m.p.h. there were three or four loud reports, and the final collapse occurred a few seconds later after the machine had swung gently to the right. In their statement the De Havilland Aircraft Company say that the failure is understood and is of a relatively simple character. The weakness is being remedied in production machines.

Seriously Arctic?

COL. LINDBERGH'S visit to the Soviet Union seems to be more than an ordinary holiday trip. According to Finnish newspaper accounts, he is travelling on a special mission on behalf of a big American airline group which is interested in the possibilities of an intercontinental airline between the Soviet Union and the United States of America. Col. Lindbergh is having daily conferences with Professor Otto Schmidt and a number of leading aviation men, among whom is M. Gromof. It is reported that serious negotiations are on foot for the opening of a regular air service from Moscow, via Bear Islands and the North Pole, to Alaska and New York.

Col. Lindbergh has made several test flights with new machines which the Soviet industry has designed and produced for Arctic flying, and a correspondent of the Finnish newspaper, *Hufvudstadsbladet*, has gathered from a telephone interview with Col. Lindbergh that he and Gromof are preparing a non-stop flight to New York in April or May next. Immediately following this initial flight, it is further reported, a regular service will be opened next summer.

The China National Affair

STRONG feelings were aroused last week by the attack which was reported to have been made on a China National Aviation Douglas which was flying on its normal service between Hongkong and Hankow. The incident has been made more serious by the fact that China National is partly American owned and the pilot was in any case of American nationality.

According to the original statement the machine was attacked by Japanese fighters both in the air and after a forced landing in a creek. The most recent reports say that twelve of the seventeen occupants were either killed or drowned. The Japanese Foreign Office, however, say that the machine was not fired on, but was chased after "suspicious behaviour" and was forced to put down near an island in West River. Although the Japanese Government explained that constant care is exercised to prevent such possibilities, they could not accept responsibility for civil machines flying in the war zone. The affair occurred on Wednesday of last week.

The "Cygnus" Accident

THE Italian authorities have duly investigated the accident to *Cygnus*, one of the Imperial Airways fleet of Short Empire boats, which occurred in Brindisi Harbour on December 5 last year. In this accident the steward and one passenger were killed, while the radio operator and five other passengers were injured.

Assuming that there were no defects in the material, the authorities have concluded that the causes might be looked for in one or more of four possibilities. These four were: Overloading; the existence of a swell which caused the machine to leave the water too soon; the presumed action of the pilot in forcing the machine off either by incorrect use of the flaps or otherwise; and the presumed staving-in of the lower part of the nose after the second impact.

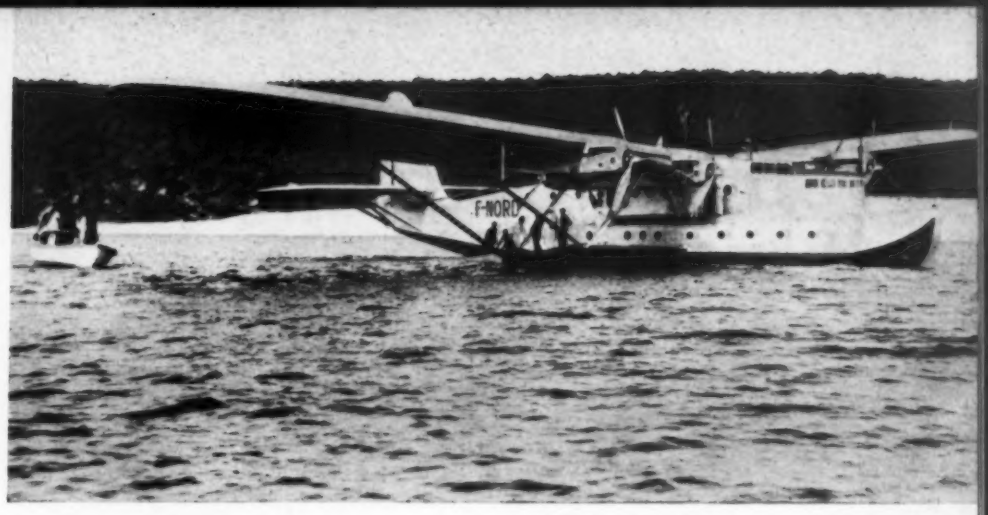
From consideration of the evidence, the chief inspector of accidents at the Air Ministry is satisfied that there was no defect in the control system or in the structure, and that the machine was carrying less than the maximum load—which was, in any case, correctly distributed.

The already known conclusion has been reached that the captain of *Cygnus* attempted to take off with the flaps in the full down position, and that this maladjustment was due to the fact that the routine take-off instructions between the captain and the supernumerary captain were not carried out and checked. As a result of trials it has been found that the machine will porpoise with the flaps in this position, and if the porpoising is not immediately checked the boat will quickly go out of control.

The incorrect setting of the flaps, therefore, was the cause of the accident, and the chief inspector goes on to explain that rescue and salvage operations were promptly and successfully carried out by the Brindisi authorities, and that the first officer showed great courage in making his way into the rear cabin to save three passengers who were unable to help themselves.

Since the accident Imperial Airways have reviewed the routine instructions in connection with the take-off and are satisfied that these are adequate. A reminder has, however, been sent to all concerned. The second pilot in this case, on being given the word "flaps," adjusted them into the fully down instead of the take-off position.

Commercial Aviation



STILL THE "LIEUTENANT": On Tuesday of last week the veteran Latécoère flying boat left Biscarosse, where it is seen in this photograph, for Lisbon, the Azores and New York. The flight is being made easily and with the sole object of studying the North Atlantic route. The machine's new registration markings are interesting.

Postponement at West Hartlepool

CERTAIN technical difficulties appear to have arisen in the matter of the preparation of West Hartlepool's new airport, which was to have been opened on September 18 by Sir Kingsley Wood. The official ceremony will, therefore, not take place until the spring of next year. No definite date has yet been given.

French Pilot's New Post

M. LOUIS COUHÉ, director-general of Air France-Transatlantique, has appointed Paul Codos, pilot-inspector of Air France, to a new post on the staff of Air France-Transatlantique. The official designation of the post is "Chef de service aerien," and it will give Codos practically dictatorial powers of control over all experimental flights across the North Atlantic.

The duties falling to Codos will include the preparation of machines for these flights, the selection and equipment of bases, the working out of itineraries and routes, and, especially, that of carrying out experimental flights at high altitudes. The new appointment does not mean the relinquishment by Codos of his post with Air France, but rather that he has been lent to the transatlantic concern by his company.

Frequency Allocations

FROM the very start aircraft wireless services have been working under the considerable handicap of inadequate frequency allocations. This handicap is particularly noticeable because such comparatively small power is available in aeroplane equipment, and interference is, therefore, a very serious problem.

At the recent Cairo International Telecommunication Conferences it was agreed to make exclusive allocations for European use. These involve 90 Kc/s in the 160-2,000 Kc/s band; 885 Kc/s in the 2,000-25,000 Kc/s band; and 16,500 Kc/s in the 25,000-200,000 Kc/s band. By way of a return for these allocations, which total 17,475 Kc/s, it was agreed that the aircraft services would waive their rights in certain bands.

In the course of the Conferences allocations were made for radio services in other forms of transport. The decisions as they affect aeronautical services are discussed in the July issue of *Electrical Communication*.

Automatic SOS

BY European standards the United States of America is a very sparsely populated country, and it is not unusual for the remains of transport aeroplanes which are involved in serious accidents to lie undiscovered for considerable periods. Only a few weeks ago a T.W.A. Douglas was discovered in the Sierra Nevada mountains three months after it had actually been reported as missing.

For this reason the idea of installing an automatic radio distress signal transmitter is not as unreasonable as it may at first sound. Apparently an English physicist, Mr. Anthony Easton, has developed a little two-valve transmitter working on a 5-metre wavelength which will, after starting work, repeat a distress call steadily for as long a period as three days. For obvious reasons, this transmitter is housed in the tail of the machine, where it is insulated against severe shocks and is surrounded by asbestos. Its aerial is a short metal rod running from the fuselage along the leading edge of the fin, and the automatic switch which turns the transmitter on is a pendulum. Any heavy jolt swings it forward into its lock and starts the transmitter. In case a very heavy landing puts the set into operation a tell-tale light is arranged on the pilot's instrument board to remind him to replace the pendulum.

Simplified Guide

NOWADAYS air travellers are taking much more interest in the type of machines in which they expect to travel on their various journeys. One often hears, for instance, the remark that somebody or other prefers to travel by "A" Airways rather than "B" Airlines because the former use some particularly fast and comfortable machine.

In the guide which is now being issued every month by Lunns, the machines which are used on the different services are given and in some cases illustrated. For instance, it is interesting for the lay passenger to learn that he can travel to Berlin either in a Douglas D.C.3, a Junkers Ju. 52, a D.C.2, or a Savoia Marchetti S83, depending on the particular service and route which he uses.

Overland to India

WITH the appearance of the first of the A.W. Ensigns for Imperial Airways, special interest is being taken in the new landplane route to Egypt and India.

The machines will make their first call at Le Bourget and will then fly *via* Lyons, to Marseilles and so to Rome, Naples, Malta, Benghazi (Libya), Mersa Matruh, in Cairo. Thereafter the service to India will continue through Lydda (the recently laid-out aerodrome for Jerusalem), Rutbah, Baghdad, Basra, Bahrein, Shariah, Jiwani and Karachi. Across India the landing points are familiar—Jodhpur, Delhi, Cawnpore, Allahabad, and so to Calcutta.

The route as far as Egypt is almost entirely new where Imperial Airways are concerned, though for some time an experimental service was operated by them between London, Paris, Marseilles and Rome. It has not yet been finally decided whether Mersa Matruh will be the intermediate landing point between Benghazi and Cairo; K.L.M. at present use this as a refuelling point on their far-eastern service.

The Ensigns which will be used for the services to India are very much heavier than any other types which have previously been put on this route, and a good deal of work has been necessary in consolidating, and in some cases enlarging, the aerodrome surfaces beyond Cairo. D/F equipment has also had to be installed at a number of aerodromes which had not previously been used and at two points, Malta and Jawani, special rest-houses have had to be built. The latter point is a small village on the Baluchistan coast. It may be hoped that everything will be ready by the time the new machines are actually in service.

The introduction of the Ensigns to the India service will also involve important and previously announced reorganisation in other matters. Indian Transcontinental Airways will no longer operate between Karachi and Singapore, but will take charge of the through landplane service from this country on equal terms with Imperial Airways. For this purpose they are taking over four of the eight Ensigns which will be used for the service. The eastern-type A.W.s will be restricted in passenger capacity because of the very much heavier mail loads that are now being carried; in day-flying form there will be 27 seats in three saloons, and for night-flying there will be 20 sleeping berths. At present the Alexandria-Karachi landplane runs are still being made by H.P.42s, and these are at present maintaining the new fast schedule by flying day and night, carrying mails only. Altogether five services are now run to India, three of them by flying-boats.

Although no official performance figures have yet been issued, it is generally understood that the Ensign has a maximum speed of 200 m.p.h. and a cruising speed of 170 m.p.h. As explained in last week's issue, the payload is well up on contract, something like 500 lb. more being carried. More recently there have been strong, and now apparently confirmed, rumours that one of the fourteen Ensigns on order will be used as the lower component of a new landplane composite.

EXPERIMENTAL DEMONSTRATION

Some of the Varying Equipment Carried in the Heston Phœnix Used by Standard Radio for Demonstration and Test Work.

"Flight" photograph.

The Heston Phoenix used by Standard Radio has a D.H. controllable pitch airscrew. The small size of the streamlined loop enclosure is noteworthy.

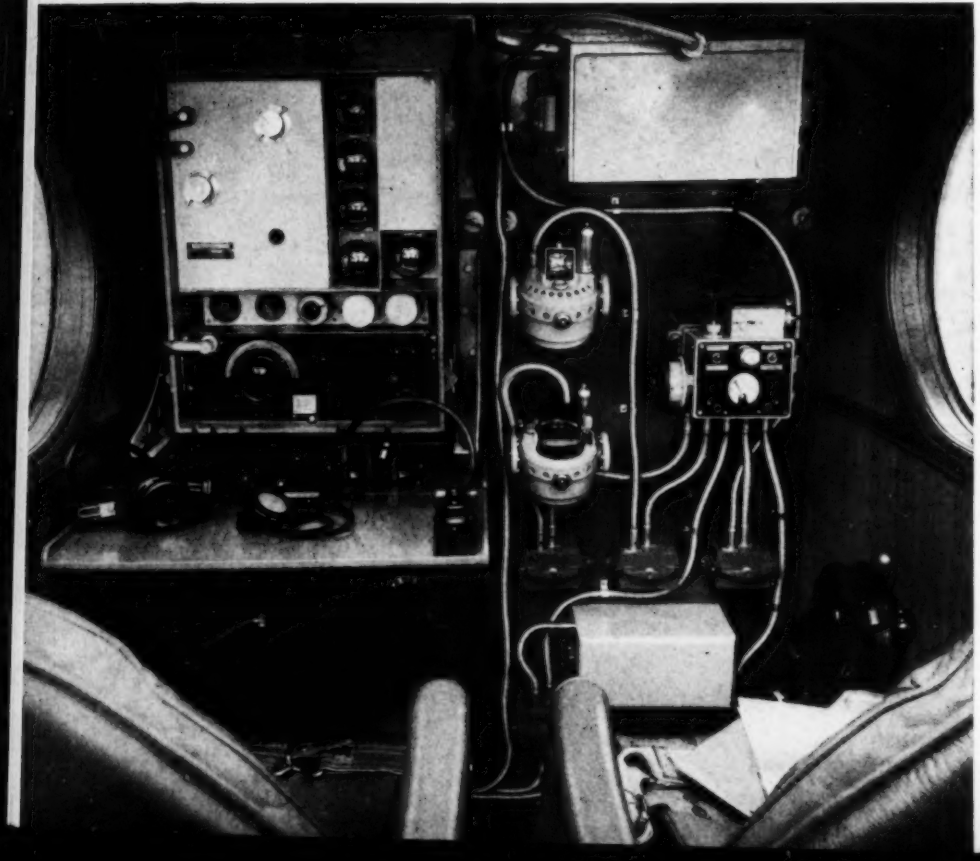
DURING the past year or so interested persons at most of the European airports and at many aerodromes in this country will have seen the distinctively coloured Heston Phœnix which is used by Standard Telephones and Cables for test and demonstration work with the various items of wireless equipment produced by this firm. It is a pity, perhaps, that this particular type of machine is no longer in production, since the amount of this equipment, with the weight of the necessary ancillary items, provides a very good demonstration of the really useful amount of payload which can normally be carried by the Phœnix. Furthermore, though there may be as many as four different and self-contained items of radio equipment installed, there is still plenty of space in which to move about.

Naturally enough, this equipment varies from week to week according to the nature of the particular demonstrations and tests which are being carried out. Just now the machine carries a D/F and homing receiver; a short-wave transmitter and receiver for use by fighter pilots; a normal medium-wave transmitter with its complementary receiver; and Lorenz-type blind-approach receiving equipment. The latter does not always remain in the machine, though the indicator is a permanent feature of the dashboard layout. At other times the Standard radio compass has been found in the machine, though more recently work has been going on in the development of an improved version of this item and it is to be expeced that a more compact and similar type of compass will be appearing in the near future. Undoubtedly, its first practical demonstration will be made in the Phœnix.

Compact Equipment

Although for a single-engined machine, the Phœnix is particularly roomy, the very fact that so much material can be installed without seriously reducing the amount of free space suggests that the equipment concerned is usefully compact. In its normal demonstration form the machine is fitted with four chairs, two of them for the pilot and imaginary co-pilot—the latter facing the D/F receiver and the fighter short-wave transmitter controls—and two at the rear for demonstration and test work with the two-way equipment and the radio compass when this is fitted. The demonstrator pilot, Mr. Auping, at least on Continental trips, usually carries out all the work himself with the assistance, perhaps, of an operator/engineer.

Nowadays, the majority of commercial machines are designed to carry their own direction-finding equipment, but, as all of them, in any case, carry two-way medium-wave equipment, this can reasonably be considered as the most important demonstration item on the list. In this, which is made up of the AT.14 transmitter and R.2 re- receiver, the six most used wavelengths are fixed and the controls consist simply of an off-send-receive



Some of the special equipment which may be carried against the rear bulkhead of the Phoenix. On the left is the normal medium-wave transmitter and receiver, while on the right is the radio compass receiver with its two indicator units. Its place is normally taken by the ultra-short-wave blind-approach receiver. Just at present an improved version of the compass is being developed.

"Flight" photograph.

The loop-setting control and its bearing dial as they appear in the roof of the Phoenix. The outer ring of the dial is separately rotatable and can be moved to set the machine's compass bearing so that, from the moving cursor, the magnetic bearing of any particular station may be directly read off. In the centre of the dial there is a quadrantal error curve, so that the amount of this error can be seen for any particular bearing shown by the cursor.

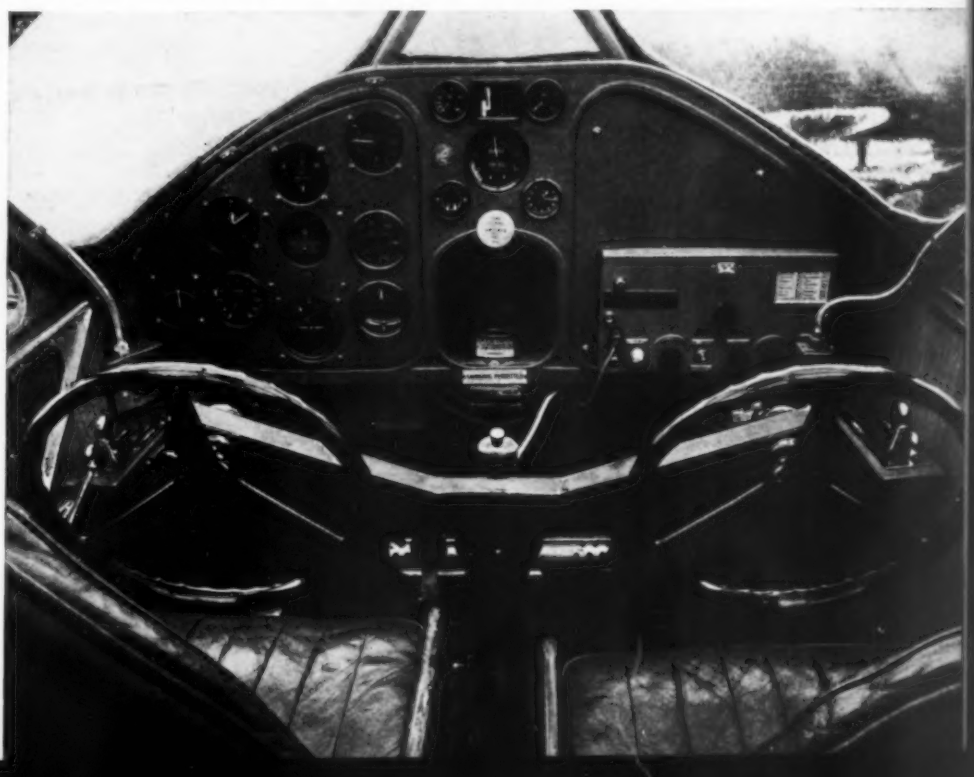
"*Flight*" photograph.

switch, a control for changing over between C.W., telephone and I.C.W.; a six-position control for the fixed wavelengths; and a switch-over for use when the trailing aerial must be wound in and the fixed aerial used. When necessary the tuning of the six fixed wavelengths can be readjusted by means of a screwdriver. The controls are arranged for remote operation. Although the set is normally tuned-in for use with trailing aerial, no further adjustment is required when the set is switched over to the fixed aerial, since a large condenser is used to load up the latter to the same capacity. In the Phœnix the power for the two sets is obtained from a pair of rotary convertors working from the main battery. A small table, with a gas and explosion-proof tapping key, is arranged in front of the set and this can be folded away when not in use.

Fighter Short-Wave

As an example of the way in which radio equipment can, from the operators' point of view, be delightfully simplified, the R.10 fighter-type short-wave transmitter and receiver outfit is particularly interesting. Four pre-set wavelengths varying between 40 and 120 metres (7.5 and 2.5 megacycles) are used and these are set before leaving the ground. The pilot then merely has to move the transmission and reception levers to one of the four positions according to instructions and the use of the four channels. These levers work in the same gate and can be moved separately, but are usually locked together for control simplification. At the lower end of the gate, which, in the Phœnix, is mounted below the co-pilot's dashboard, are two transverse operating levers, one to bring the equipment into action and another for his personal electric heating circuit. The microphone is combined with a heated oxygen mask. With the main switch in the "on" position the receiver is in action; when the pilot wishes to reply he presses a button which starts the rotary convertor and changes over from receiving to sending. In the case of the Phœnix this control is arranged in the centre of the control fork, while the equipment itself, in a single unit, is installed in the luggage compartment at the rear of the machine. This short-wave outfit has a range of about 100 miles at 10,000ft., though this range, with such short wavelengths, is slightly reduced at lower altitudes. The weight of the entire equipment is 50 lb.

The direction-finding equipment, which is covered in a general way by the designation R.9, is produced in two essential forms, either as a plain homing device or as a self-contained direction-finding station. In each form both the weight (35 lb.) and the price is such that the equipment can be considered as being suitable for use by the owner of a reasonably sized light aeroplane. The loop has a diameter of 3½in. and is arranged in a small streamlined bakelite casing. The receiving set, which is mounted in the dashboard of the Phœnix, covers the wavebands of 250-750 and 750-2,000 metres, with a necessary overlap, and in this particular installation the maximum quadrantal error is as little as 4 degrees. This error is plotted as an enclosed curve on the loop bearing plate itself so that it can be read off directly as a plus or minus figure on the cursor as any particular bearing is being taken. There is no need, consequently, to carry a separate graph covering the varying errors of different bearings.



The dashboard of the Phoenix carries, on the left, normal blind-flying instruments as well as homing and blind-approach indicators, while on the right is the built-in D/F receiver. Below the latter and out of sight behind the right-hand wheel is the control gate for the short-wave fighter set.

"*Flight*" photograph.

When operating the equipment for direction-finding the station is tuned-in on the fixed aerial and then switched over to D/F, the loop being turned until the homing indicator on the dashboard remains steadily in its centre position. In order to simplify the business of obtaining the direct compass bearing of the station being used, a movable outer ring on the bearing dial can be set at a figure to tally with that on which the machine is flying by compass, and the magnetic bearing of the station can then be read off directly. In a general way the method of obtaining this as a true bearing is to add that of the loop dial (in relation to the fore and aft axis machine) to the compass reading and then subtract 360 deg. and the appropriate deviation. The movable outer ring on the bearing plate does away with the necessity for direct calculation.

For homing purposes the loop is locked with a key in its zero position, and the sensitivity of the indicator needle can then be varied on the volume control. Naturally enough, the homing needle works in exactly the same way as a turn indicator when flying towards a station and in the opposite manner when flying away from a station. Obviously, therefore, the act of turning one way or the other will tell the pilot at once whether or not he is flying towards or away from any particular station to which he has tuned—and will also tell him when he has passed over this station.

Although the R.C.5 radio compass may now be considered as obsolescent in its original form, the newly developed equipment is likely to be similar in its general principles. When this type of D/F equipment is being seriously used on a large transport aeroplane it may be expected that two compass units or indicators will be carried, one covering 360 deg. for use by the navigator, and another covering a few degrees on each side of a pre-set zero mark for use by the pilot, in the same way as a directional gyro, when flying on a particular course. In the last case allowance can, of course, be made for drift. With the original equipment the maximum error in the Phœnix was plus or minus 2 or 3 deg., and, up to reasonable ranges, the effects of night error are unnoticeable.

The sequence of operation, even with the old type, is fairly simple. The operator switches on to normal reception until a selected station is properly tuned in. He then switches over to "oscillation" and completes the tuning before moving the volume control back to a point where the milliameter needle is opposite a suitably marked segment, indicating a power which gives the best results on its dial. The set is then switched over to the spinning loop and the bearing is read off in the compass window.

Probably, the Standard Radio Phœnix is most often used for practice and demonstration flying on the ultra-short-wave blind-approach beams, and the place of the radio compass is usually taken by the Lorenz receiver, its accessories and H.T. batteries. The control panel for this is mounted below the dashboard on the pilot's side and the indicator dial is, of course, installed in its rightful place among the blind-flying instruments on the pilot's panel. Apart from the homing indicator, this panel carries an artificial horizon and directional gyro as well as a sensitive altimeter, so that all practice blind approaches are being made with the type of equipment normally carried on transport aeroplanes.

The machine as a whole has been laid out specially for radio experimental work and all the cables, for instance—the total length of which probably runs into miles—are laid in special ducts which are quickly detachable so that the leads can be examined at any time. With so much electrical and sometimes experimental material on board, there is always, one supposes, the very small possibility of short-circuiting and consequent fire risk. The Phœnix carries adequate fire extinguishing equipment and, in addition, both the pilot and the passenger wear parachutes.

AMONG the NEW BOOKS

Biographical

"My Life," by Jean Batten; 8s. 6d., Geo. G. Harrap.

IN this book Miss Batten tells the story of her various solo long-distance flights, first painting in a background of her childhood in her native New Zealand and of her flying training at the London Aeroplane Club in its Stag Lane days.

Her adventures start with her England-Australia flight in 1934 in a sixth-hand Gipsy I Moth; Australia-England in the same machine the following year; England-South America in November, 1935, in her Percival Gull; England-New Zealand in the same machine (October, 1936); and back again to England in the early part of this year. Between these major adventures are interludes of shorter flights, tours and so forth.

Though Miss Batten's book should appeal to the non-flying reader (as is doubtless intended) she skates over those practical details which interest the initiated One feels, too, a certain lack of any light relief; a rather earnest primness is not made any more readable by a steady recurrence of *clichés* ("a profusion of beautiful flowers" and "a profusion of gaily coloured flowers" both occur on facing pages). But, if the reader does not mind being lectured to rather than spun a yarn he will like this book.

"Women With Wings," by Pauline Gower; 10s. 6d., John Long, Ltd.

A CONTRAST is found in this, another woman pilot's book. The reader must again be prepared to wade through a luxuriant profusion of *clichés* (everything happens with "a sickening thud"), but the going is made a lot easier by Miss Gower's gay *insouciance*.

Everybody in aviation knows now Pauline Gower, as pilot, and Dorothy Spicer (now Mrs. Pearse), as fully licensed ground engineer, operated a Spartan on taxi, joy-riding and air display work. Here Miss Gower offers the inside story of these activities. She flew thousands of joy-riders without mishap, though, judging by some of her confessions, a very special providence must have been watching over the Avian.

When travelling air circuses become totally extinct (and the time seems very near) the future historian will be able to learn a lot about them from Miss Gower's book. She succeeds completely in conveying the impression of the endless labour of touring—the long hours, car journeys and cross-country flights, problematical fields, accidents to aircraft and personnel, and always malevolent weather.

A definitely entertaining book, even if 10s. 6d. does seem rather a high price for 223 pages that can be read in an evening

"Airman Lost in Africa," by Carel Birkby; 15s., Frederick Muller, Ltd., 29, Great James Street, London, W.C.1.

AN even more complete contrast faces the reader here. Carel Birkby is a newspaperman who went as a passenger with John Williamson, a well-known Cape Town charter pilot (and pre-war Brooklands flying man) on a flight up the West Coast of Africa and down through the Belgian Congo in an abortive search for a Swiss pilot, Carl Nauer, who had disappeared in his Puss Moth while attempting a London-Cape record. Williamson flew an old Desoutter.

Although this happened five years ago, and the story is only now told, it has lost nothing, for the reason that Birkby is such an accomplished writer. Occasionally he tends to over-dramatise the story (which, as fate decided, was to have no climax), but most of the time his descriptive powers are so vivid that the reader has a probably perfect mental picture of that unpleasant West Coast. He has, too, an entertaining habit of digressing to spin a first-rate yarn about, perhaps, illicit diamond buying or some other aspect of African adventure, on which he is obviously an authority.

Anthology

"The Unending Conquest; Being an Anthology of Flight." By R de la Bere. 1s. 4d. J. M. Dent and Sons, Ltd.

IT was an attractive idea of Professor de la Bere, of the R.A.F. College, Cranwell, to make an anthology which picks out many of the most attractive passages from books and other writings about flying in peace and war. The list of authors from whom this book gives extracts includes the Wright brothers, H. C. Biard, Gordon England, McCudden, Barker, H. A. Jones, Cecil Lewis, "McScotch," Lindbergh, Gayford, Waghorn, Norman Macmillan, as well as others.

One curious misprint should be corrected in future editions. The incident entitled "A Balloon Strafe," on page 81, is wrongly attributed to H. A. Jones' *War in the Air*. It actually comes from *Fighter Pilot*, by "McScotch."

The book is most attractive value for its trifling price.

Among the New Books.

A Year in the States

"The Aircraft Year Book for 1938," edited by Howard Mingos, published by the Aeronautical Chamber of Commerce of America Inc., price 6.50 dollars.

UNIQUE among the air annuals in that it publishes general arrangement drawings of all current types of American civil and military aircraft, apart from installation drawings of engines and some really outstanding photographs, this work is a comprehensive survey of what America has done in the aeronautical field during the past year. Included among the data are figures for purchases of equipment by the United States Army and Navy and a complete statement of the value of American aeronautical exports for 1936 and 1937.

Intelligent Anticipation

"Where Do We Go from Here," edited by Joseph Mayers and Bernard Spiers; 8s. 6d., Frederick Muller, Ltd., 29, Great James Street, Bedford Row, London, W.C.1.

THERE is always something interesting about any attempt to foresee future developments, and nowadays, with such inventions as the aeroplane and television with which to make a start, the earnest prophet should be able to make good use of his abilities. In this book a number of different people, experts and otherwise, explain what they think will be the future of everything from films to physical fitness and from television to transport.

Lt. Col. H. Burchall, the general manager of Imperial Airways, contributes a short article on the immediate problems of commercial aviation. He explains the Empire Air Mail scheme, gives various figures to show the value returned for subsidies, mail payments and so forth, and tells the reader something about the various problems involved in flying over different countries. Of true prophecy, however, there is very little, and Col. Burchall is probably being very wise in refusing to be drawn into a discussion about a means of transport the future of which has always been unpredictable. All he does is to explain the plans and possibilities of Atlantic flying on a commercial scale.

Service Facts

The Royal Air Force and the Air Forces of the British Empire Year Book, 1938. Compiled by Leonard Bridgman; edited and published by Sqn. Ldr. C. G. Burge. Printed and distributed by Gale & Polden, Ltd., price 5s.

THERE are two very good reasons why this most attractively laid out work should find favour both in and out of the Service; it is a most complete and commendably accurate collection of facts and data relative to the organisation, history, and equipment of the R.A.F.; and all the profits from sales are to be devoted to the R.A.F. Benevolent Fund.

Special sections are assigned to the Fleet Air Arm and Air Forces of the British Empire, and a coloured inset depicts international aircraft markings and R.A.F. decorations and badges. The illustrations of Service activities are of the kind which have evoked high commendation in the foreign aeronautical Press.

Deus Ex Machina

"The Clouds Remember," by Leonard Bridgman; commentary by Oliver Stewart; 10s. 6d., Gale and Polden.

A VERY beautiful book which should go far toward preserving the memory of great aeroplanes. Mr. Bridgman's drawings are quite the most pleasing and accurate of their kind we have seen and are obviously the work of a man who knows and loves his subject.

The text is not only tremendously interesting in its intimate presentation of facts, but is written in masterly style. Of the Avro 504K it is said: "It was a thing which came together like a work of art comes together, by a sudden inexplicable harmoniousness of parts. It is the supreme example of the aeroplane as the work of art . . . ."

The cavalcade of subjects ranges from the Bleriot monoplane to the Siskin and Flycatcher. Merits and vices are recorded impartially; the victories of old warriors are effectively chronicled.

This book, like the Avro, is a real work of art.

MILITARY NOORDUYN

Training Norseman: A Popular Canadian Type in Service Guise

FOR a long time America produced very nearly all the machines of the rather special character which were required by Canadian operators, but during the last year or two the Canadian-built Noorduyn Norseman has had a virtual monopoly in this single-engined high-duty class. All the better-known transport companies have bought one or more, and Canadian Airways own and use as many as five of these machines.

Recently, the Norseman has been modified for use as a classroom trainer with the Royal Canadian Air Force, and four special examples have already been delivered. These machines are each arranged for the instruction of five or six pilots in the use of navigation, bombing and radio equipment. The now standard Service blind-flying panel is fitted and full dual is, of course, provided.

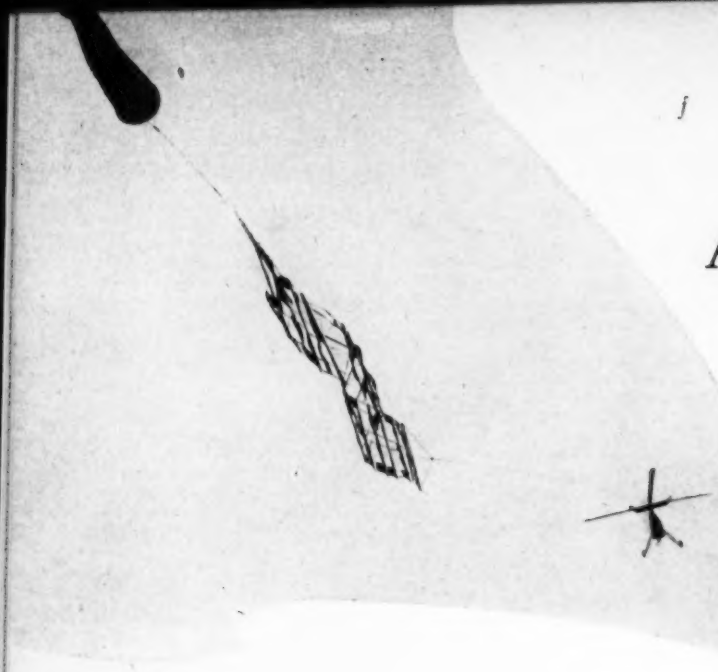
A standard form of course-setting bombsight is installed in that part which, with the normal commercial type, is the forward area of the freight compartment under the floor. This bombsight is reached through a trapdoor, and does not, therefore, restrict the floor space. In order to provide the necessary field of vision for its use a curved Perspex panel is built into the belly of the fuselage.

The large windows in the rear cabin doors can be lowered and the sills are fitted with retractable bearing compass mountings, with a wind deflector in each case. The large freight-loading openings in the fuselage, which are covered with removable panels, remain a feature of the trainer type of Norseman, so that the machine may, when not used for training, become a useful military transport. Nine fully equipped infantrymen can be carried and for ambulance purposes the removable panels are an obvious virtue.

The radio operator and navigator in the military Norseman are seated immediately behind the cockpit, while folding seats are arranged along the sides for the students, leaving plenty of room for them to move about. The two-way radio equipment is installed in a complete and quickly removable cage at the rear of the cabin. As in the case of the commercial model the wheel undercarriage is quickly interchangeable with floats or skis.

The Noorduyn Norseman, as a landplane, has a maximum speed at 5,000ft. of 170 m.p.h., a service ceiling of 22,000ft., and a range of 600 miles. In seaplane form the figurs are, respectively, 154 m.p.h., 20,000ft. and 550 miles, while the gross weight is of course, the same—6,450lb.

The Canadian-built Norseman in its military training form. To outward appearance, apart from the Air Force markings, there is very little difference between this and the standard commercial type, which is being used in quite large numbers for general transport work.



THE AIR ADVERTISEMENTS BILL

By a BARRISTER

In spite of its brevity (it has only four clauses) the Bill introduced recently by the author of "Holy Deadlock" suffers from ambiguity in the wording of its clauses and in the definitions of the "devices" to which the Bill is intended to apply

The wording is also such that sky-writing appears to be included, although it is the least noisy on account of the height at which it is carried out.

THE aerial-advertising business, or rather that part of it which consists of towing a pennant or streamers through the air by means of an aeroplane, has been carried on in recent years with periodical indiscretions of an amazing character. Last year a pilot flew over Manchester during the Armistice Day silence, advertising a brand of peas! A few weeks ago another flew over the House of Commons during a debate, and shortly afterwards a pilot flew close to Buckingham Palace during a Royal garden party!

It is not, therefore, surprising, though somewhat unfortunate, that a Bill, called the Air Advertisements Bill, has been presented to the House of Commons by Mr. A. P. Herbert, with eleven supporters from all parts of the House. It is clearly intended to abolish this form of advertising altogether. The Bill is a short one, having only four clauses. The first of these contains the prohibition, the second the penalties, the third the definitions, and the last the name and date of commencement, that is January 1st next.

"Devices"

The first clause begins:—

"No advertisement shall be exhibited upon or by means of any aircraft, balloon, parachute, kite or other similar device in flight over any part of the United Kingdom or of the territorial waters thereof."

Two matters are worth noticing here; first, it is not clear whether airships and gliders are to be included among the "devices." Usually airships and gliders are included in the definition of "aircraft" in Air Navigation Acts and Orders, either expressly or by necessary inference. But so are balloons, which in the above clause are expressly included. It may be that the promoters of the Bill hope that they will be included under "similar device." The position ought to be clarified.

Secondly, the clause is apparently wide enough to include sky-writing, as this is an advertisement exhibited by means of an aircraft in flight over the United Kingdom. Probably the promoters of the Bill did not intend to include this form of advertising, which has for the most part escaped causing any hostile criticism. Indeed, on the rare occasions on which sky-writing is practicable it appears to give considerable pleasure and attracts a great deal of willing attention. The aircraft engine is, moreover, almost inaudible on the ground owing to the height at which sky-writing is carried out.

By the proviso to Clause I an attempt is made to exclude from the prohibition transport aircraft exhibiting the names of its owner and "of the places from and to which such aircraft is flying." It follows, for example, that an aeroplane on the regular London to Paris service which had "London-Paris" on it would commit an offence when flying on test to and from an aerodrome, or on another route, if the words were an advertisement under the first part of the clause. As drafted at present the proviso does not afford adequate protection to air-transport undertakers.

The penalties are £10 for a first offence and £50 for each subsequent offence. Imprisonment is not directly imposed, although a person who does not pay a fine goes to prison under the general provisions of the Summary Jurisdiction Acts. The maximum that the Police Court can inflict in connection with the fine of £10 is two months' imprisonment, and three months' with a £50 fine, in each case with or without hard labour. A limited company cannot, in the nature of things, be sent to prison. The remedy in such a case is by distress on the company's goods.

Three classes of persons are liable for infringing the provisions of the Bill:—

(a) Persons who exhibit or cause or procure the exhibition of the advertisement, including persons who are in charge of or release the aircraft, etc., and those whose goods are advertised unless, in the last case, there is proof that they did not procure.

(b) The owner of the aircraft, balloon, etc., who permits the offence.

(c) The owner of any premises, ship or aircraft who knowingly permits to be moored thereto or to be released therefrom any balloon, parachute, etc., upon or by means of which any offending advertisement is exhibited.

Ambiguity

Under (c), therefore, an owner of premises is not forbidden knowingly to permit *aircraft* to be released therefrom for purposes of illegal advertisement. The expression "premises" includes land, so that it appears as if some sort of protection for the owners of aerodromes and landing fields was intended. It is not clear what is the reason for this limited immunity, for such owners could commit an offence if the "device" that was released were a balloon, parachute, etc. We do not know how a parachute is released from an aerodrome, but that is irrelevant.

The definitions are of interest. Thus "ship" includes boat, raft, buoy or other floating craft of any description. Where any aircraft, balloon, ship or premises is let, hired or demised, the expression "owner" means (not includes) the tenant or hirer. This suggests a method of evasion by letting to an *ad hoc* company, although in such a case the pilot or other operator, and the person whose goods or business was being advertised, would be liable.

Not only does the Bill appear to need revision in detail, but even in principle one suggests that it goes too far. The aerial advertising business *can* be carried on so as to cause a nuisance, and it therefore needs regulating, but isolated acts of annoyance to people in prominent and influential positions is not a good and sufficient reason for abolishing it altogether. After all, it amuses and interests far more people than it annoys.

PRIVATE FLYING

Topics of the Day

Snob Clubs?

LAST week I suggested that some of the present "A" licence pilots who make a habit of hiring club machines for long-period travels might experience more and more difficulty as the C.A.G. scheme gets into its stride. When I said that I had not read the letters, on more or less the same subject, which appeared elsewhere in the same issue. These letters seem to me to be extraordinarily sound, if a trifle depressing and inevitably dog-in-the-mangerish.

The fact seems to be that there will be certainly a place for two or three clubs, particularly in the London area, where everything goes on exactly as before. These clubs would charge the present flying rates, their machines would be available for cross-country work with reasonable periods of wait on the ground, and the centres concerned would primarily be country clubs.

So far as one can visualise the future, this country club atmosphere is bound to disappear, for better or for worse, under the new regime, at least in a large number of cases. Already we see news pictures of rows of mildly uniformed people (for purposes of popular consumption these are usually women) receiving some unnamed form of mass navigation instruction, or being drilled on the tarmac parade ground. That is just the sort of thing which, as a possibility, I was inclined to complain about in the first place. It may or may not be a true and logical picture of the conditions which will obtain at the average C.A.G. centre next year, but it at least gives the present club people a considerable if unreasonable fear of future developments.

No doubt all those enthusiastic new-comers who see in the scheme their first real chance of going into the air will allude to any such die-hard flying centres as "snob clubs." But there it is, and if any club committee thinks that it will do better by keeping entirely clear of C.A.G.-ment, that is surely their business. Personally, I should not be in the least surprised to find that one or two clubs do, in fact, carry on more or less on present lines. I am not quite sure of the position about the original subsidy arrangement, but no doubt the clubs concerned will look very carefully into the matter before deciding to remain unmoved. They would certainly look very sick indeed if the Air Ministry decided that, if they were not prepared to take the C.A.G. subsidy, then they could carry on without subsidy at all. Perhaps they would.

Extra Flying

ONLY those who have worked out the various costs and so forth will know where they stand in the matter of post-graduate flying, but on the face of it it seems that one correspondent was very right indeed when he said that it was doubtful if extra-flying enthusiasts would be encouraged, even at the normal high rates. His suggestion that the country will shortly possess an enormous number of licensed pilots, who are prevented by the very nature of the scheme from obtaining a reasonable degree of efficiency, also has a deadly ring of truth and merely helps to confirm *Flight's* own unpopular opinions about the ten-hour limit which were expressed when the scheme was first announced.

However, in a general way there is one bright light burning for the flying community as a whole in these very unhappy features of the scheme. If enthusiastic amateurs find that they are not able to obtain aeroplanes for love or money except for the direct purpose of making aerodrome circuits or of flying straight to B and back again, then they will be forced to buy their own aeroplanes. And many of those who at present make use of club machines can easily afford to do so. I know of two or three amateurs who spend anything up to £500 every year with their own clubs.

So that even if, as I suggested last week, the number of machines which will actually be required by the clubs is still not great enough to cause a major manufacturing boom, the firms concerned can take heart from the thought that they should at least sell a few more to private owners.

Coupled with the thought of the new and attractive possibilities which are opened up for thousands of people who were previously unable even to consider the idea of learning to fly, this likelihood gives the whole scheme, so to speak, a credit balance where the interests of the community at large are being considered. The few score dogs-in-mangers can still form, if necessary, their own select and inevitably high-priced clubs. Good luck to them.

Flap Sink

EVER since (to change the subject) split flaps were first applied to aeroplanes it has been the accepted idea that these should not be raised suddenly when flying near the ground. The contention, borne out by apparent fact, has been that if the flaps are raised at any speed the machine sinks a matter of five or ten feet.

The other day I was talking to the young co-designer of a small flapped aeroplane and he firmly stated that not a single reason could be effectively brought forward to show that any loss of height should be experienced in such circumstances. And it must be admitted that it is very difficult to imagine why it should.

The effect of raising the flaps is simply that of very slightly increasing the wing loading, and of moving the centre of pressure (I hope—where is my technical friend?) farther back. Provided that the machine has plenty of flying speed there should be no loss of height. There have, of course, been cases in which pilots have taken off with the flaps, say, in the 15-deg. position and have promptly dropped back on the ground (sometimes in the next field) after raising them. In these cases it is obvious that the machine in each instance must have been flying at a speed fairly near the stall and the act of raising the flaps has left little in reserve. The majority of aeroplanes start to sink quite rapidly long before they are actually stalled, and the machine which flies level, say, at 50 m.p.h. with the flaps down may be starting the sink at the same speed and attitude when the flaps are up.

This designer's idea—and he is an amateur pilot himself—seems to me to be that the change of effective incidence resulting from flap-raising merely alters the flight path and leaves the machine in what is, virtually, a momentary glide. He contends that if, at the moment of raising the flaps, the nose is pulled up a trifle there would be no loss of height whatever.

All this may appear to be incidental and unimportant, but this flapped low-wing technique must be thoroughly understood for reasons of safety, and the sink effect is very

PRIVATE FLYING (CONTINUED)

much mixed up with the considerable dangers involved in the careless use of the flaps. The operation of these, it must be remembered, change the flying characteristics of an aeroplane, and though this change may be very slight it always offers definite possibilities of danger to the unwary.

As far as the ordinary light and medium-sized aeroplane is concerned, the reduction in the stalling speed and the improvement in the take-off run resulting from the use of flaps are of no importance whatever. All that is really required are effective and adjustable air brakes, and the flaps, generally speaking, are merely useful because they tend to improve the stalling characteristics and to increase the efficiency of the ailerons at low speeds. And it is not with many machines that they do even that.

INDICATOR.

C.A.G. POINTS

New Clubs : Experience With the Pupils : How They May be Graded

WITH the institution of the Civil Air Guard it is likely that quite a few new clubs will be starting operations in various districts, and the Air Ministry has apparently received a number of enquiries about the conditions which govern their formation.

The present clubs, whether subsidised or otherwise, are being recognised for participation in the scheme without further approval, but any new organisations will naturally need to comply with the conditions which have always governed the approval of subsidised clubs.

Perhaps the most important of these conditions is that the club must be incorporated as a limited liability company and must, in its articles of association, bind itself to a limited dividend of 5 per cent. per annum, any additional profits being used to improve the facilities provided. When approved, a club must enter into an agreement with the Air Ministry in which the Secretary of State for Air has power to control the directors' fees, the rents, the salaries, the management expenses, and so on, and he may also call for the accounts to be inspected at any time.

In the new conditions each club must also obtain the recommendation of the C.A.G. Commission as well as the Air Ministry approval, and in considering their recommendation the Commission will naturally take into account the present training facilities in the particular area concerned. In cases where organisations which are considered to be capable of meeting all the needs of a particular district already exist, no recommendation will be given.

In the meantime there are quite a few ways in which the grading of C.A.G. applicants may be carried out. One of the pioneer clubs in this country recently interviewed the first 125 of their many applicants, from whom 50 were to be selected for immediate training. Before the interview each one was given a complete summary of the scheme, in which the costs and obligations were carefully set out. This was done because the club did not want anyone to come in who was not prepared to take the training seriously.

Three officials of the club, all experienced pilots and/or instructors, were on the job, and they divided the applicants into three separate classes. The first consisted of those who were considered temperamentally and physically fit in every way and who could start training more or less at a moment's notice. The second class was made up of those who appeared to be suitable but were either not quite up to average "A" standard or could not find time to fly during the day—which, in fact, with the arrival of the autumn meant that their training could not be started until the spring. Applicants of doubtful suitability or with other obligations (such as those with A.R.P.) made up the third class.

The district concerned may, of course, be a particularly fruitful one, but the numbers in the different classes certainly suggest that the club in question will in due course be training a good and useful selection of people. Of the 125 applicants, 57 went into the first class, 42 into the second, and only 19 into the third, while 2 were rejected owing to the fact that they already had Reservist obligations; 5 others, after studying the scheme in detail, apparently departed without filling in their enrolment forms.

Of the 57 in the first class, 38 were prepared to do only morning flying, 32 could only fly during the week, 16 were prepared to fly all day and any day, and 9 could fly only at the week-ends. The great majority of the applicants' ages were between 20 and 30, and about 10 per cent. were women. Needless to say, their occupations were just about as diverse as could possibly be imagined. Ten of them, taken at random in the order of interview, were, respectively, a ladder salesman, a public baths engineer, a domestic worker, a director and general manager, a manufacturer's agent, a taxi driver, a salesman, a sculptor, a garage proprietor, and an aircraft mechanic. On the face of it, at least four of these could, if they felt inclined, have learnt to fly very comfortably at the old rates.

London–Cardiff (via Swansea)

THIS year's London-Cardiff race will be run over a course which will be slightly different from that used in previous events. As before, the start will be at Heston airport, but after flying over Cardiff aerodrome the machines will turn over the landing field at Porthcawl and over the Jersey Marine aerodrome at Swansea before flying back to Cardiff and crossing the finishing line.

The race will be run on Saturday, September 10, and the start will presumably be as usual, and, weather permitting, at about 2 p.m. All machines, however, must be at Heston for verification not later than 10 a.m. There will be four cups as well as cash prizes totalling £70 for the three leaders and the fastest time; entries should be sent to the Cardiff Aeroplane Club.

A Thousand Gliding Certificates

THE thousandth British gliding certificate was granted by the Royal Aero Club at its last committee meeting. It is just over eight years since No. 1 was given to the late C. H. Lowe-Wylde, who made his qualifying flight on March 30, 1930.

No glider pilot can really be considered as a fully competent pilot until he possesses the "C" certificate, which is given for a soaring flight lasting at least five minutes. Of the thousand British glider pilots, 427 have so far qualified for this certificate. In 1930 certificates were granted to 115 pilots, of which only 5 proceeded to "C" stage. By 1933 the annual figure had sunk to 31, but since then, no doubt due partly to subsidy help, numbers have jumped rapidly, and during last year 231 new certificates were granted, while 132 pilots passed the "C" test.

LIGHTWEIGHT TWIN: Following "Indicator's" remarks in last week's issue, this new German twin-engined machine, which has been built by Gothaer Waggonfabrik is of interest. It carries three people at a maximum speed of 125 m.p.h. on two 42 h.p. inverted Zundapp engines.

FROM the CLUBS and SCHOOLS

LONDON

THE flying time for last week was 154 hr. 35 min., and three members—Messrs. Loch, T. H. Norman and H. Green—completed the tests for their "A" licences. Mr. T. H. Norman had, during the same week, made his first solo. Six new members joined.

BOURNEMOUTH

Cross-country flights to Romford, Hayling Island and Shanklin were undertaken last week and 48 hours were flown in the fortnight ended August 28. Two new members joined.

MARSHALL'S

Cross-countries were flown to Le Touquet, Clacton, Oxford, Hendon, and so forth, and a total of 60 hr. 30 min. was logged for the week. Miss Owen and Mr. Omar have completed their "A" licence tests.

BRISTOL AND WESSEX

Messrs. D. A. Webb and G. G. Whitting have qualified for their "A" licences, and flying for the month of August, so far totals 121 hours. Five hundred and sixty applications for the C.A.G. have been received to date.

REDHILL

Mr. R. D. Tapley made the night flight for his "B" licence and Mr. H. F. Campbell obtained his "A" licence. For the week ended August 21, a flying total of 143 hr. 55 min. was achieved. Ten new members joined the club.

NORTHAMPTON

Two "A" licence candidates of the Northamptonshire Aero Club have spent a fortnight under canvas on the aerodrome while undergoing instruction. A tennis dance was held on Friday, August 26, and was well attended by over 100 members. Flying time is well up to average.

SOUTH COAST

The Bellars challenge cup was competed for during last week-end, but the results have not yet been received. A large number of new members caused Mr. Pashley to be heavily booked up, and 42 hours flying was done. Mr. W. H. Anderson qualified for his "A" licence.

HERTS AND ESSEX

For the fornight ended August 25 there was a total of 268 hr. 13 min. flying times. Messrs. R. C. Sankey and G. A. Pickett carried out their "B" licence night flights and Mr. W. B. Ellis went solo. Passenger-carrying tests found Mr. J. Cooper a successful candidate.

ROMFORD

For the week ended August 21 only a few hours instruction was possible in view of the bad weather and because pupils are awaiting the C.A.G. scheme and cheaper rates. The Midland Bank F.C. is now affiliated to the Romford Club, and have provided two Swallows for the use of the members

EDINBURGH

During last week 22 hours flying was done by the Edinburgh Flying Club, of which 17 represented dual. Six passenger flights were made and four machines visited the club—to say nothing of the eight airline passengers who were received. There are now seven hundred applicants for the Civil Air Guard.

READING

The past week proved quite good for flying, Saturday being an especially busy day. A few air visitors turned up, and among the departures were Messrs. Nicolas Perard and Georges Ravier for Le Bourget. Mr. Ralph Hope took his test for the "Barnes" cup, the closing date of entries for which is August 31.

C.A.S.C.

The somewhat poor attendances at Cambridge can still reasonably be considered as being caused by the holidays, but the prospect of even less expensive flying than that offered to Corps members must take some of the blame. During last week-end 7 hr. 5 min. were flown. Next week-end it is hoped that C.A.G. flying will start.

YORKSHIRE

The Yorkshire Aeroplane Club's flying for the month has been badly reduced by the recent unfavourable conditions, and 180 hours is, so far, the total time flown. A number of charter trips have been booked, including one to Rome, and the end-of-the-month figure should be improved thereby. The C.A.G. forms have arrived and training will start on September 1.

HANWORTH

It is anticipated that the first section of the Civil Air Guard applicants will start flying on Thursday, September 1. Taking advantage of ideal weather conditions members have made extensive cross-country flights, two as far afield as Devon and Manchester. The club Leopard is away on a tour in France, and last week 125 hr. 40 min. represented the total flying done. Mr. Snyders completed his "A" licence tests and Mrs. Griffiths made her first solo.

BROOKLANDS

A forced-landing competition was held last Sunday and competitors, as usual, were marked on handicap by F/O. Bremridge. He again featured an "emotion" column on his score card. The competition was won by Mr. Holder with Mr. Nepean Bishop as runner-up. The 1938 competitions will come to fruition at the end of September, when the holder of the highest score will take home the "Ted Jones" trophy. One hundred and twenty hours were flown for the week ended August 28.

NORFOLK AND NORWICH

Flying for the week ended August 21 was more or less confined to that done by experienced pilots owing to the extremely rough weather which prevailed for most of last week. Cross-country flights were made to Skegness and Cambridge aerodromes, and some night flying was done. For volunteers under the C.A.G. scheme a reduced fee for trial lessons is fixed at 10s. 6d. instead of £1 1s. In the gliding section the chief instructor made a flight lasting over an hour. He would have stayed up longer, but he began to feel the cold.

CEYLON

On August 7 the Ceylon Aero Club's first competition was held at Ratmalana. Some sixteen competitors indulged in a little flour-bag bombing, while the Tiger and Gipsy Moths used were flown by Flt. Lt. Duncanson, the chief instructor, who endeavoured to retain a fixed height and speed during each competitor's three attempts. The winner was Mr. R. A. Farquarson, with a distance from the target of a little over 10ft. The club's new Tiger with long-range tanks should be in Ceylon early next month.

KARACHI

Flying conditions were far from favourable during July and, with four inches of rain, the aerodrome was unsafe for club flying during 48 hours. One hundred and four hours were flown. Mr. Badlani obtained his "A" licence, and Mr. T. N. Malik came from Himat-Nagar to do night flying for the renewal of his "B" licence. During the last part of the month more flying was possible and seven pupils were being given instruction. The ground engineering section is very busy and a machine which had been entirely rebuilt by apprentices satisfactorily underwent its trials.

MADRAS

A short, but very useful, visit to Madras Flying Club was made by Mr. T. H. Distur, of Air Services of India, Bombay, when he undertook the duties of instructor pending the return of Mr. Tyndale-Briscoe in August. At the end of July a bi-monthly bombing competition was held—and won by Mr. V. Sundaram with 28 points out of 30. The secretary points out that this was all the more creditable because of the strong wind at the time so that each pilot had to aim about 20 yards off the target in order to have a chance of hitting it. Mr. B. S. Leete, of the Directorate of Civil Aviation, arrived on July 22 on an inspection tour of the flying clubs of India.

JOHANNESBURG

In the Governor-General's cup race two members, Mrs. E. J. Peall and Mr. Len Spoor, were placed third. Baragwanath was one of the control points and competitors were entertained to breakfast and morning tea on their arrival. The Durban Air Rally also took place during July, when Mr. D. Milligan won the De Havilland trophy in the inter-club competition, Mr. D. Dunn carried off the Pylon race and Messrs. J. A. Williams, D. Dunn and E. Newborn came first, second and third respectively in the obstacle race. The efficiency competition was held on Sunday, July 3, and was won by Mr. Pessen.

The Lorenco Marques Air Rally, the first air rally to be held there, is to take place on September 3 and 4. The programme includes an arrivals competition, christening of the D.E.T.A. Junkers inter-club take-off and landing competition, balloon bursting competition, car bombing, and aerobatic display to be followed by a cocktail party and farewell dance at the Polana Hotel.

Extensions to the aerodrome are in progress and work on two new houses, for occupation by members of the staff, has been started. Mr. D. D. Longmore, until recently honorary secretary and instructor to the Leicester Aero Club, has joined the staff as instructor. During July 512 hours were flown and Messrs. H. Murman, Robinson, Gray and Human made their first solos. Mr. J. Lindbergh obtained his "A" licence, and Messrs. Saunders and Meiring obtained their "B" licences.

Buying Machines

FOR a start it is unlikely that many of the smaller clubs will be in a sufficiently strong financial position at the beginning of the C.A.G. operations to purchase outright the machines which are required. In order to overcome this difficulty, facilities for the purchase of the necessary equipment have been arranged by Bowmaker, Ltd., 26, St. James's Street, London, S.W.1. The scheme is planned on normal hire-purchase lines and is operated by branches in different parts of the country, all being administered by a special aircraft department of the firm.

Private Flying

SOUTHENDING the SEASON

Demonstrations and Racing in a Haze

Illustrated with "Flight" Photographs

SOUTHEND-ON-SEA may suggest to some people only whelks and eels (which is a libel); but it certainly required the wriggling propensities of the latter to reach the Southend Flying Club's At Home through a most un-August-like murkiness last Saturday afternoon. In spite of the presence of this near-relative to a fog which settled over practically the whole of England, a surprisingly large number of visiting aircraft arrived, although E.T.A.s in some cases were not quite up to usual standards.

A bird's eye view of a small section of the member's enclosure. In the haze, above the two Hart Trainers, can be seen the Percival Vega Gull, flown by Mr. D. M. Bay.

From the spectators' viewpoint the hazy conditions were very nearly ideal for "At Homing," as they successfully toned down the strength of the sun's rays to just the right temperature for a comfortable afternoon's lounge in the members' enclosure. By 2.30 p.m. all was set for the first part of the programme, which started to the minute with a series of genteel shootings-up and stall turns by the Hon. A. Dalrymple in a Chilton. This was followed by a polished display of ultra-slow flying and more stall turns by Mr. Prentice in the Taylorcraft. The next demonstration was to have been given in one of the new Aeroncas, but at this juncture it had not arrived, and Mr. Neville Browning, from Abridge, extemporised with one or two slow rolls in the single-seater Tipsy.

Promptly at 3 p.m. two Hawker Hart Trainers emerged out of the haze and landed, the first bearing Capt. Harold Balfour, M.C., M.P., Under-Secretary of State for Air, and the second, Mr. Henry Channon, M.A., the popular M.P. for Southend. No sooner had the two visitors shed their flying kit than six R.A.F. Gloster Gladiators, from No. 74 Squadron (Hornchurch), thundered overhead in formation as if by way of a salute. Under Sqn. Ldr. G. S. Sampson they proceeded to carry out perfectly timed evolutions which must have been exceedingly difficult in the prevailing haziness above.

While Capt. Balfour and Mr. Channon were inspecting some of the visiting aircraft, Mr. Brian Allen went aloft in the new Tipsy two-seater. As the loud speakers assured the assembled company, that "funny little man with the bald head" is a very skilled pilot, and he proceeded to justify these kind words with a series of daringly low tight turns opposite the club-house. He brought his show to an end after an unexpected whoop of joy to which he gave vent while flying low past the crowd with engine throttled back.

Next came a polished demonstration of slow and fast flying

Officials step forward to greet Capt. Harold Balfour on his arrival. On the right is Capt. G. E. Weber, president of the Southend Club.

Capt. Balfour appears to adopt a menacing attitude towards a seemingly apprehensive Brian Allen ; but he is merely inspecting the two-seater Tipsy.

by Mr. D. M. Bay in a Percival Vega Gull, followed by Mr. Donald Rankin, who had undertaken to give an aerobatic display in one of the Club's Avro Cadets. After a false start caused by one of the front cockpit door flaps opening, he proceeded to reel off loops, slow rolls and stall turns—in fact a whole gamut of excellent stunts, to the intense interest of the crowd below. The various evolutions were admirably explained by Mr. W. W. Lyon-Shaw over the loud speakers.

Meanwhile, members of the Avenue Aeromodellers' Club monopolised the western half of the aerodrome with models that seemed bent on intercepting a flight of pigeons which wheeled aimlessly above.

While the competitors were lining up for the *pièce de resistance* of the afternoon—a 54-mile race over a triangular circuit—Mr. Bonar, from Luton, showed how well suited a De Havilland Tiger Moth is for aerobatics. His was a show carefully thought out for public consumption, and included loops galore, a half-roll off the top of a loop, slow rolls and a host of other tricks of the trade.

Just as he finished there came a thunderous snarling roar, and a Supermarine Spitfire streaked across the aerodrome to disappear into the haze. A second or two later it returned, to fly incredibly slowly (with wheels and flaps down) over the aerodrome—a most convincing show.

The Race

With practically no wind the nine competitors in the race were able to take off on their direct course for the first leg of the 18-mile circuit, the three turning points of which were Canewdon radio masts, the flour mill at Battlesbridge, and a partly denuded beacon in the middle of the aerodrome. Over nineteen minutes separated the departure of the limit man, N. M. Browning (Tipsy) and F/O. Geoffrey de Havilland in the T.K.2. The Tipsy reached the end of its first lap just as the T.K.2 was despatched. At the end of Lap 1 the starting order was unchanged, but A. R. Ward's little Chilton was obviously creeping up on the gallant old Spartan piloted by S. A. Kew. Another to forge ahead was L. Lipton in his Puss Moth. On the second lap the Tipsy single-seater was still well out in front, but quite a lot of overtaking occurred on the aerodrome turn. The Puss Moth nipped in front of the two-seater Tipsy, piloted by Brian Allen, while H. D. Rankin's Tom Tit followed in their wake, hotly pursued by the Leopard Moth, piloted by A. S. Lucas.

The finish provided an excellent climax. At least half the entry was in sight as the T.K.2 swept low over the aerodrome, chased by Henshaw's Vega Gull, a bare ten seconds behind. The Puss Moth nipped into third place, passing Browning's Tipsy over the aerodrome boundary, to the huge enjoyment of the crowd.

Final Place.	Pilot.	Machine.	Handicap.	Time.	Speed.
			min. sec.	min. sec.	m.p.h.
1	G. de Havilland...	T.K.2	Scratch	38 33	172
2	Alex Henshaw ...	Vega Gull ...	1 42	38 44	156.5
3	L. Lipton ...	Puss Moth ..	5 53	40 06	115
4	N. M. Browning...	Tipsy	19 32	40 12	81.5
5	H. D. Rankin ...	Hawker Tom Tit	7 41	40 43	113.5
6	A. R. Ward ..	Chilton	12 22	40 45	97.5
7	A. S. Lucas ...	Leopard Moth ...	5 55	40 47	120.5
8	Brian Allen ...	Tipsy Two-seater	11 48	42 55	93
9	S. A. Kew ...	Spartan	16 41	43 41	80

Afterwards, at the presentation of prizes, Capt. Harold Balfour emphasised in a brief speech that the occasion was the first at which he had been able to speak of the Civil Air Guard since its inception. He explained that the object of the C.A.G. was to bring flying within the reach of everyone, and thereby complete a chain of voluntary organisations which in totalitarian countries were obtained by compulsion. He went on to stress that the new movement was not a part of the Air Ministry, but was run by the clubs for the clubs, with the Ministry standing by only in an advisory capacity. He gave the assurance that everything was going on all right so far as the administration side was concerned, but delays were bound to occur, which, he hoped, would be met with by a spirit of toleration.

No sooner had Capt. G. E. Weber replied than, with a slickness which was typical of the Southend Club's organisation, Miss Ray Clarke, made a parachute jump from approximately 2,000ft. By dint of clever manipulation of the shroud lines, she contrived to touch-down neatly in the centre of the field.

And so ended the first part of the Southend Club's At Home. One by one the visiting aircraft left to probe their way homewards through the murk. F/O. Geoffrey de Havilland disappeared in the T.K.2, bound for Hatfield, where he later took up the ill-fated Albatross. Other pilots, members and guests stayed to continue the party in lighter vein that evening.

Altogether the At Home had been a most enjoyable affair. Throughout the afternoon the programme had been run to a rigid time schedule. Individual turns were kept as brief as possible and, above all, there was plenty of variety. There was one small point which called for criticism, and that concerned the question of joy rides. Throughout the afternoon a roaring trade was done. But could not this sideline have been confined to the interval and after the programme had terminated? As it was they were most distracting, both to onlookers and to pilots

As if by way of a salute, a flight of Gloster Gladiators from No. 74 Squadron (Hornchurch) thunder overhead on the arrival in two Hart Trainers of Capt. Balfour and Mr. Henry Channon, M.P. for Southend.

SERVICE AVIATION

Royal Air Force and Official Announcements: Fleet Air Arm News: Military Aviation Abroad

Mr. HORE-BELISHA, the War Minister, visiting the Anti-Aircraft Practice Camp at Watchet, where he saw the 61st Anti-Aircraft (Territorial) Battery shooting at a Queen Bee.

Interest in Cyprus

LT.-GEN. SIR ROBERT GORDON-FINLAYSON, G.O.C. British troops in Egypt, accompanied by Air Vice-Marshal H. R. Nicholl, Air Officer Commanding Middle East, arrived in Cyprus last week.

King George V Review Commemorated

THE first inspection of the R.A.F. by a reigning sovereign is commemorated by a plaque at Mildenhall which was unveiled by Sir Kingsley Wood on August 23. The review in question was held by King George V on July 6, 1935.

A New Medal

HIS MAJESTY THE KING has been graciously pleased to approve of a new medal being struck to commemorate operations in, or on the frontier of, India, to take the place of the existing medal. This medal will be known as the "India General Service Medal, 1936," and will have a distinctive ribbon (khaki centre, flanked on each side by a narrow red stripe and edged with broader green stripes).

Envoys for India

AIR MARSHAL SIR PHILIP JOUBERT DE LA FERTÉ, K.C.G., C.M.G., D.S.O., Air Officer Commanding R.A.F., India, visited the Airspeed factory on Tuesday to take delivery of the first of two Envoys for the Communications Flight in India. The aircraft will also be used by His Excellency the Viceroy.

Apart from the cabin arrangement, this machine is similar to the one used by His Majesty the King. Blind flying instruments and the latest type two-way wireless with D/F equipment is installed. The engines are Armstrong Siddeley Cheetahs IX, which give a top speed of 210 m.p.h. The Air Marshal will personally pilot one Envoy on its delivery flight to India. He will be accompanied by Flying Officer King, who will be in charge of the second machine.

Extensions of Service

THE following detailed instructions are issued regarding the methods of selection for extensions of service of officers of the general duties branch due to transfer to the reserve on or after April 1, 1939:—

(i) *Extension of Service of Medium Service Officers.*—Extension of service to complete eleven years on the active list, followed by four years in the reserve, may be granted to medium service officers due to transfer to the reserve on or after April 1, 1939, and prior to April 1, 1940, who volunteer nd are recommended therefor. The gratuity in respect of the eleventh year of service will be £100.

(ii) *Extension of Service of Short Service Officers to Seven Years.*—The service of short service officers commissioned on or after April 1, 1933, and prior to April 1, 1934 (and therefore entered for six years on the active list followed by four years' reserve service) who volunteer and are recommended, may be extended to seven years on the active list, followed by four years in the reserve. The gratuity in respect of the seventh year of service will be £100.

The Malayan Sunderlands

THE names *Perak, Selangor, Pahang* and *Negri Sembilan* have been given to four of the Sunderland flying boats sent out to Singapore. The Sultans of Malaya have contributed £292,000 towards their cost. A fifth will probably be called *Johore*. Six of the eight Sunderlands ordered have been delivered.

Merlin-engined Whitleys

WHITLEY aeroplanes fitted with Merlin IV engines will be known as Whitley IV, and when fitted with Merlin X engines will be known as Whitley V.

Command Organisation

THE R.A.F. Station, Grantham, is being transferred from Bomber Command, No. 5 (Bomber) Group to Training Command, No. 23 (Training) Group with effect from August 15.

Sassoon Photographic Trophy

THE competition for the photographic trophy presented by Sir Philip Sassoon has this year been won by No. 50 (Bomber) Squadron, stationed at Waddington, with a percentage of 92.2 marks. This squadron is commanded by Sqn. Ldr. R. B. Sutherland, D.F.C.

Leuchars Station

ON August 26, as foretold in *Flight* of July 21, No. 1 F.T.S. moved from Leuchars to Netheravon, and No. 6 F.T.S. from the latter station to Little Rissington, near Cheltenham. Nos. 224 and 233 (G.R.) Squadrons are moving from Thornaby to Leuchars. Group Capt. E. O. Grenfell, M.C., D.F.C., A.F.C., is assuming command of Leuchars station.

Aircraft Apprentices Wanted

THE Royal Air Force is offering approximately 1,000 vacancies at schools for aircraft apprentices to boys between 15 and 17 years of age on New Year's Day, for training as aircraftmen in highly skilled trades. Entry is mainly through an entrance examination in English, mathematics and science to be held at local centres on November 1. Nominations for the examination must reach the Air Ministry not later than October 4.

Full information as to pay and prospects are contained in A.M. Pamphlet 15, obtainable on application to the Inspector of Recruiting, Royal Air Force, Victory House, Kingsway, London, W.C.2.

SERVICE AVIATION (CONTINUED)

Foreign Officer Attached

CAPT. SEPAHPOUR, of the Imperial Iranian Air Force, has been attached to Hemswell Station from August 24 until September 6.

Flying Training Schools

THE undermentioned officers have been awarded special assessments on completion of a course of flying training at No. 8 F.T.S., Montrose:—

Distinguished Pass

A.P/O.s F. F. Taylor and H. J. Woodward.

Flying Accidents

THE Air Ministry regrets to announce the following accidents:—Sgt. Frederick Arthur Casewell (pilot) and A/C.1 William Albert Beckett lost their lives in an accident which occurred at Uplands, Kenya Colony, on August 24, to an aircraft of No. 223 (Bomber) Squadron, Nairobi, Kenya. The third member of the crew, A/Sgt. Wilfred Mann, was slightly injured.

P/O. Francis Thomas May (pilot) and A/C.1 Terence Bagge lost their lives in an accident which occurred near Tulkarem, Palestine, on August 26, to an aircraft of No. 6 (Bomber) Squadron, Ramleh, Palestine.

AIR MARSHAL SIR PHILIP JOUBERT DE LA FERTÉ (Air Officer Commanding, R.A.F., India) and F/O King on the occasion of the Air Marshal's visit to the Airspeed works to take delivery of the first of two Envoys for India **(see page 188)****.**

Royal Air Force Gazette

General Duties Branch

Air Comdre. C. W. H. Pulford, O.B.E., A.F.C., is appointed Director of Volunteer Reserve Expansion, Air Ministry (August 15). Lt. Cdr. J. D. C. Little, R.N., is reattached to the R.A.F. as Flight Lieutenant, with effect from August 12 and with seniority of July 1, 1936; F/O. L. D. Dadswell (Acting Flt. Lt.) is promoted to the rank of Flight Lieutenant with effect from April 1 and with seniority of July 1, 1937; F/O. L. C. Bicknell (Acting Flt. Lt.) and F/O. D. F. Dixon are promoted to the rank of Flight Lieutenant (June 15).

The following Flying Officers are granted the acting rank of Flight Lieutenant on the dates stated:—R. G. Forshaw (May 20); K. J. Mellor (May 24); F. C. Hopcroft (July 13).

F/O. J. K. M. Drysdale (Capt. The Royal Scots) is granted the hon. rank of Flight Lieutenant (August 1).

Accountant Branch

F/O. F. C. Hayward (Acting Flt. Lt.) is promoted to the rank of Flight Lieutenant (June 1).

Medical Branch

Flt. Lt. S. R. C. Nelson, M.D., M.C.P. & S., is granted a permanent commission in that rank (August 20).

Chaplains Branch

The following are granted short service commissions with the relative rank of Squadron Leader on the dates stated:—The Rev. C. S. J. Haskins (August 8); the Rev. S. W. Betts (August 12).

Princess Mary's Royal Air Force Nursing Service

Sister Miss M. E. Hards, A.R.R.C., is promoted to the rank of Senior Sister (August 22).

Reserve of Air Force Officers

General Duties Branch

F/O. B. S. Brice, A.F.C. (R.A.F., ret.), is granted a commission as Flight Lieutenant in Class C (March 28) (substituted for notification in the *Gazette* of July 19); the notification in the *Gazette* of July 26 concerning Flt. Lt. H. W. A. Chesterman is cancelled.

Flt. Lt. A. J. R. Moss relinquishes his commission on completion of service and is permitted to retain his rank (December 9, 1937); Flt. Lt. W. A. Floyer relinquishes his commission on completion of service (July 20).

Medical Branch

Flt. Lt. D. Loughlin, M.R.C.S., L.R.C.P., relinquishes his commission on completion of service and is permitted to retain his rank (June 27).

Auxiliary Air Force

General Duties Branch

No. 903 (COUNTY OF LONDON) (BALLOON) SQUADRON.—R. G. Frith is granted a commission as Flight Lieutenant (July 5).

No. 905 (COUNTY OF SURREY) (BALLOON) SQUADRON.—M. G. Begg is granted a commission as Flight Lieutenant (July 5).

No. 906 (COUNTY OF MIDDLESEX) (BALLOON) SQUADRON.—G. J. Rayner is granted a commission as Flight Lieutenant (July 5).

No. 907 (COUNTY OF MIDDLESEX) (BALLOON) SQUADRON.—G. M. Trundle is granted a commission as Flight Lieutenant (July 5).

Royal Air Force Appointments

General Duties Branch

Air Commodore.—C. W. H. Pulford, O.B.E., A.F.C.; appointed Director of Volunteer Reserve Expansion, Air Ministry, 15.8.38.

Group Captain.—F. H. M. Maynard, A.F.C., to Air Ministry, 9.8.38; for duty as Deputy Director of Staff Duties, vice Group Capt. A. W. F. Glenny, M.C., D.F.C. E. O. Grenfell, M.C., D.F.C., A.F.C., to R.A.F. Station, Leuchars, 4.8.38; to command.

Wing Commanders.—W. A. K. Dalzell, to No. 1 School of Technical Training (Apprentices), Halton, 28.7.38; for Administrative duties and to command No. 2 (Apps.) Wing vice Wing Cdr. S. P. Simpson, M.C. G. M. Knocker, to Special Duty List, 2.8.38. S. M. Park, to H.Q., Coastal Command, Lee-on-Solent, 8.8.38; for Engineer Staff duties vice G/Capt. W. S. Caster, M.C. S. P. Simpson, M.C., to R.A.F. Station, Thornaby, 4.8.38; to command vice G/Capt. E. O. Grenfell, M.C., D.F.C., A.F.C. J. H. Butler, to H.Q., No. 17 (Training) Group, Lee-on-Solent, 16.8.38; for Air Staff duties. J. P. Coleman, A.F.C., to Directorate of Volunteer Reserve Expansion Air Ministry, 16.8.38. S. B. Harris, D.F.C., A.F.C., to Directorate of Organisation Air Ministry, 16.8.38. J. L. M. Hughes-Chamberlain, to R.A.F. Station, Hucknall. 11.8.38; to command.

Squadron Leaders.—D. W. Bayne, to R.A.F. Station, Kenley, 8.8.38; for administrative duties. W. J. Crisham, to No. 6 F.T.S., Netheravon, 13.8.38; for duty as Chief Flying Instructor. E. J. Laine, to No. 4 F.T.S., Abu Sueir, Egypt, 29.7.38; for administrative duties. C. L. Lea-Cox, to H.Q., Maintenance Command, Andover, 11.8.38. G. E. Nicholetts, A.F.C., to Deputy Directorate of Organisation, Air Ministry, 15.8.38. A. E. J. Pratt, to No. 56 (F.) Squadron, North Weald, 11.8.38; to command. C. H. A. Stevens, to R.A.F. Station, Tangmere, 13.8.38. C. H. C. Woollven, M.C., to Record Office, Ruislip, 11.8.38; for Administrative duties. T. S. Horry, D.F.C., A.F.C., to No. 1 A.-A.C. Unit, Scletar, 1.8.38; to command. F. C. Cole, to H.Q., Maintenance Command, Andover; for Air Staff duties, 14.8.38. L. R. S. Freestone, to Directorate of Technical Development, Air Ministry, 13.8.38. G. W. Hayes, to H.Q., Maintenance Command, Andover; for Engineer Staff duties, 13.8.38. A. Leach, M.C., to R.A.F. Station, Eastchurch; for Administrative duties, 15.7.38. I. B. Newbigging, to H.Q., Bomber Command, Uxbridge; for Signals duties, vice S/Ldr. E. M. Drummond, 15.8.38. C. Stephenson, to No. 27 (B.) Squadron, Kohat, India; to command, 1.8.38. B. M. Carry, to Recruits Sub-Depot,

SERVICE AVIATION (CONTINUED)

Debden, 8.8.38; for administrative duties. N. Carter, D.F.C., to Deputy Directorate of Organisation, Air Ministry, 8.8.38, vice W/Cdr. S. M. Park. H. H. Chapman, to No. 3 (F.) Squadron, Kenley, 3.8.38; to command, vice W/Cdr. H. L. P. Lester. D. W. Clappen, to H.Q., Maintenance Command, Andover, 8.8.38; for Engineer Staff duties. R. S. Darbishire, to R.A.F. Station, Debden, 8.8.38; for Administrative duties. R. A. McMurtrie, to Recruits Sub-Depot, Linton-on-Ouse, 8.8.38; for Administrative duties. F. A. J. Pollock-Gore, to No. 10 (B.) Squadron, Dishforth, 8.8.38; for flying duties. W. R. Worstall, to No. 6 F.T.S., Netheravon, 6.8.38; for Engineer duties.

Flight Lieutenants. — M. A. Aylmer, to C.F.S., Upavon, 2.8.38. W. R. Brotherhood, to No. 1 Air Armament School, Manby, 10.8.38. E. B. C. Davies, to No. 2 Air Armament School, Eastchurch, 10.8.38. A. Franklin, to No. 201 (G.R.) Squadron, Calshot, 31.7.38. M. H. Rhys, to C.F.S., Upavon, 7.8.38. A. H. Allen, to No. 910 (County of Essex) (Balloon) Squadron, Chigwell, 5.7.38. G. R. Howie, to No. 4 F.T.S., Abu Sueir, Egypt, 13.8.38. L. V. Spencer, to Straits Settlements Volunteer Air Force, Seletar, 12.8.38. A. F. R. Bennett, to No. 4 Armament Training Station, West Freugh, 15.8.38. H. M. T. Eversfield, to No. 1 Armament Training Station, Catfoss, 15.8.38. D. N. J. P. Leggett, to R.A.F. Station, Linton-upon-Ouse, 15.8.38. J. G. Munro, to Directorate of Armament Development, Air Ministry, 15.8.38. E. J. Palmer, to R.A.F. Station, Bassingbourn, 15.8.38. R. G. Watson, to No. 5 Armament Training Station, Penrhos, 15.8.38. G. P. Woodhouse, to R.A.F. Station, Andover, 15.8.38. N. C. S. Rutter, to No. 4 A.-A.C. Unit, Seletar, 1.8.38. P. H. Gibbings, R. C. F. Lister, R. S. Ryan, to C.F.S., Upavon, 8.8.38.

VOUGHT SCOUT BOMBER MONOPLANES of V-B-3 Squadron, U.S. Navy. These machines can be used as dive bombers with a 500lb. or a 1,000lb. bomb.

Equipment Branch

Group Captain.—W. J. B. Curtis, O.B.E., to Directorate of Equipment, Air Ministry, 2.8.38; for duty as a Deputy Director of Equipment.

Squadron Leaders.—L. H. Hillier, to H.Q., Maintenance Command, Andover, 3.8.38; for Air Staff (Equipment) duties. J. H. P. Clarke, to R.A.F. Station, Eastchurch, 15.7.38; for Equipment duties.

Flight Lieutenant.—W. Macey, to H.Q., Coastal Command, Leeon-Solent, 16.8.38.

Owing to the greatly increased length of these lists as a result of R.A.F. expansion, ranks are confined to those of Flight Lieutenant and above.

FOREIGN SERVICE NEWS

Trimotor Floatplanes at Brindisi

ALTHOUGH at the Milan Show last October we were given to understand that the military version of the three-engined Cant twin-float seaplane had not been adopted by the Regia Aeronautica a squadron of these aircraft is now based at Brindisi. The machines appear to be fitted with Alfa-built Pegasus engines and are characterised by a pronounced "belly" for bomb stowage. It should be possible to accommodate a torpedo.

The Leo 45

OUTSTANDING among the new aircraft on order for the re-equipment and expansion of the French Air Force is the Lioré et Olivier 45 bomber with two Hispano Suiza 14AA two-row radials of 1,120 h.p. each. The machine is unusually attractive to the eye and according to a recent announcement is capable of the following performance: Top speed, 298 m.p.h.; stalling speed, 81 m.p.h.; climb to 13,120 ft., 10 min.; range in still air, 745-1,430 miles; absolute ceiling, 27,885ft.; T.V. diving speed, 388 m.p.h.

A New Vultee

DESPITE the success of the Vultee V-11 attack-bomber in the export field the manufacturers have hitherto done little or no business with the U.S. Army Air Corps. Now comes the announcement that an order has been placed by the War Department for seven Vultee YA-19 attack machines for service tests. These are said to follow the layout of the V-11, but are to be powered with Pratt and Whitney R-1830-17 Twin Wasps, whereas the export machines have used the Wright Cyclone.

The order is interesting as indicating that the Army has not been convinced that the twin-engined attack machine, typified by the Curtiss YA-18 now on Service trials, is superior to a single-engined type. If all goes well the new Vultee may be selected to replace the Northrops now in service.

AMERICAN ARMY AUTOGIROS adopt one of the most difficult formations in the book—echelon stepped up.

DOWN—BUT NOT OUT

Some Thoughts on Continental Forced Landings

By HERVÉ LAUWICK

IF you read a good manual, such as the late Colonel Henderson's now old but still invaluable book on practical flying, you should find within its covers the complete technique of forced landing. It is, as everybody should know, to remain high enough until the landing proper, that is, to describe your S's, or your L's, or your U's, whatever they are (and with a novice they will probably look more like W's) until the ground fairly comes up to kiss you.

Having thus reached the edge of the field, with height to spare, you will slip off this extra height and come in. This is where the expert scores, for he has generally, from his travelling height, spied a decent field, whereas the *débutant* find himself skating over heavy ground or a curious assortment of fifty-seven vegetables.

Our expert will therefore have chosen his field and reached it—which are two different things—slipped in with a yard to spare, skidded across the field sideways and, wildly kicking the machine again, put it down straight on its wheels.

The engine will be silent, but a certain amount of noise may still be heard. For, in the times of the Blériot XI, Mr. Anzani used to say: "You come down, see, you cut the engine, see? Then you close your eyes, and all back with a hoop. Either you hear no noise, it ise good, very good; either you hear big *boom*, then it was no good at all!"

Yes, the expert may avoid all this, and more. But the real expert is the one who evades the gendarmes.

For you may, or may not, believe that the law of May 31, 1924, is still (as I write) *en vigueur* on the Continent, and it is very vigueurous indeed. We in France are still fighting to have it modified. This law provides that no aeróplane shall land outside an *aérodrome reconnu*. If it does put its wheels down outside a recognised aerodrome, you must wait for the gendarmes or call upon *M. le Maire* either to come and see you personally or delegate his powers to the *garde-champêtre*.

The local *garde-champêtre*, overwhelmed by such responsibilities, will finally call in the gendarmes, so there is no escape from a bad lunch, a painful wait in the wind, interminable discussions—and a few holes made by affectionate fingers in your tailplane.

For the curse of the forced landing on the Continent is not so much the gendarme himself or the law, as the suspicions and the general glad but mute expectations of seeing you shot at dawn.

The main trouble is always the crowd, which comes from nowhere, appears out of every tree, rushes in, and surges over the ground, smashing the crops with the deadly finality of a swelling tide. A complete desert will spring upon you between 20 and 500 spectators within half a minute. Empty fields will produce 300 onlookers on any Monday morning at 8 a.m. And a row of six small cottages will supply the landing with as many spectators as Nero could pack into his Colosseum on a fine Sunday. Ask any *aviateur*; he knows!

A great (in fact, a most essential) ability is to be quick witted and to talk fast. He who wants to attempt forced landings needs a good landing gear and an incredibly voluble tongue.

I have landed in Holland with a stuck compass, in a football field surrounded by water and ditches, on a Sunday. Not only did the *repide* players catch me up at once, but 3,000 people, slower in action, got out of their seats and invaded the field.

Believe it or not, the gendarmes forgot to look at my papers and started to push the people back; so I was off under their nose as soon as I knew the name of the place (seventeen syllables or so).

At the beginning of the civil war in Spain I landed six times the same day, and got away, as I could talk Spanish as quickly as a Tibetan mill can grind out prayers. Two other pilots landed on the same day in Spain and were stuck. No lack of air sense on their part: they just could not beat the Spaniards at talking, shouting, and making gestures.

A friend—with 800 hours' flying—had been doing my navigation. On the way to Morocco we passed Madrid, hopelessly flying over clouds, and when we came down, very short of petrol, we looked for Daimiel, supposed to be a First Class Army Ground.

We heard later that it had no hangar, no circle; no nothing, except a First Class Donkey and Cart to take the petrol to the machines. The soldiers later told us that they had seen us circle, but evidently we did not make out in time that the donkey belonged to the Spanish Air Force. Thus we landed somewhere away in a little town, and had a long talk with two priests, complete with felt hats, and two *guardias civiles*.

Tight Corner

One other landing was done on hidden pavé, with sad results for the tail skid; once more, looking for petrol, we dropped into a field surrounded by high wires, the only one near a *pueblo* on the mountain side. At once a million fierce-looking men surrounded us. . . .

Two or three were galloping madly on their mules, raising clouds of dust, and the carburettor began to choke. We took off in a narrow lane of heads, the metal airscrew churning the air a few inches from them, and it was very lucky we did not hit anyone; they would at once have turned on us. It was impossible to get them out of the way. Here again we had not waited for the gendarmes!

Once, in France, the engine dried up over a forest. Luckily we were nearing the edge, and we cleared the last trees. It sounded like petrol trouble and we pumped all we could; we desisted when we reflected that squirting petrol might catch fire. So we cut everything off and landed carefully, choosing a nice field. (As it happened, the drive to both magnetos had broken.)

There again we beat the gendarmes at their game. Two hours later, the *panne* being located, we folded our wings and slid down into the village, pushed by all the spectators, and proudly piloting the wingless machine on the brakes.

Then we hid the machine in a large farm. When we came back, two days after, it was covered with feathers: chicken and ducks had come to see a *confrère*. A sorry sight!

But the gendarmes, who had only heard of the incident on the same morning, never dared to come near us, being afraid that their chief would charge them with neglect and ignorance of all village news for the last 48 hours.

So we got away once again.

Forthcoming Events

September 3-5. U.S. National Air Races, Cleveland.

September 10. Cardiff Aeroplane Club: London-Cardiff Race.

September 11. Gordon Bennett Balloon Race, Belgium

September 11-18. Swedish Civil Aviation Week.

September 21. Aero Golfing Society: Cellon Trophy, Richmond Golf Club.

October 15. South Coast Flying Club: Annual Dinner and Dance, Grand Hotel, Brighton.

November 18-December 4. Paris Aero Show, with Air Transport Congress.

HERE and THERE

EFFICIENCY FROM MILAN: By the use of slots and flaps the Breda 79S, which is a four-seater cabin machine of 200 h.p., has an exceptionally wide speed range. The maximum is 162 m.p.h. and the stalling speed 47 m.p.h. The normal range is 560 miles, but the installation of special tanks—increases this figure to more than 1,600 miles. The machine has an aerobatic licence and, in standard form, is electrically equipped.

Air Minister Goes Visiting Again

LAST Friday, Sir Kingsley Wood, M.P., the Secretary of State for Air, paid another of his flying visits to aircraft factories. On this occasion he inspected the Filton works of the Bristol Aeroplane Company, Ltd. He was accompanied by his Parliamentary private secretary, Sir Edward T. Campbell, M.P., and Air Commodore Roderic M. Hill, M.C., A.F.C., the Director of Technical Development, Air Ministry.

The party was received by Mr. W. G. Verdon Smith, chairman of the Bristol Company, Mr. H. J. Thomas and Colonel Sydney Smith. The tour started with a visit to the engine factory under the conductorship of Mr. A. H. R. Fedden. Then followed a visit to the flying school, production flight sheds, experimental departments and erecting hall, where a large number of Blenheims in the course of assembly were inspected.

After lunch the party left for Cardiff, where it was received at the works of Elliott Equipment and Accessories, Ltd., by the directors, Messrs. S. Kenneth Davies and K. G. Hann. During his visit Sir Kingsley Wood saw the company's methods of manufacturing parachutes for various specialised applications (e.g., supply dropping) as well as normal use.

Elliott Equipment and Accessories were formed as a private venture for this purpose, having taken over the assets of the British Russell Parachute Co.

LT. CDR. FRANK HAWKS whose death, in a recent accident, has robbed American aviation of one of its outstanding figures.

Frank Monroe Hawks

LAST week American aviation circles were dealt a cruel blow when it was learnt that Lt. Cdr. Frank Monroe Hawks, U.S.N. Air Reserve, had been killed in a flying accident near New York. *Flight* joins with them in mourning one of the most popular and best-known personalities in the English-speaking aviation world.

Frank Hawks—the "Human Bullet," as he was known to millions of newspaper readers—was forty-one years of age, and hailed from Marshalltown, Indiana. His flying career started in 1916. From 1917 to 1919 he served as an instructor in the United States Air Service, after which period he became the aeronautical adviser to the Texas Oil Company.

It is no exaggeration to say that his great interest in high-speed flying was a very considerable factor in the development of the fast transport aeroplane of to-day. In his efforts to prove the possibility of reliable high-speed flying he set up and held many international speed records and made transcontinental record flights both in America and Europe.

"Unitwin"

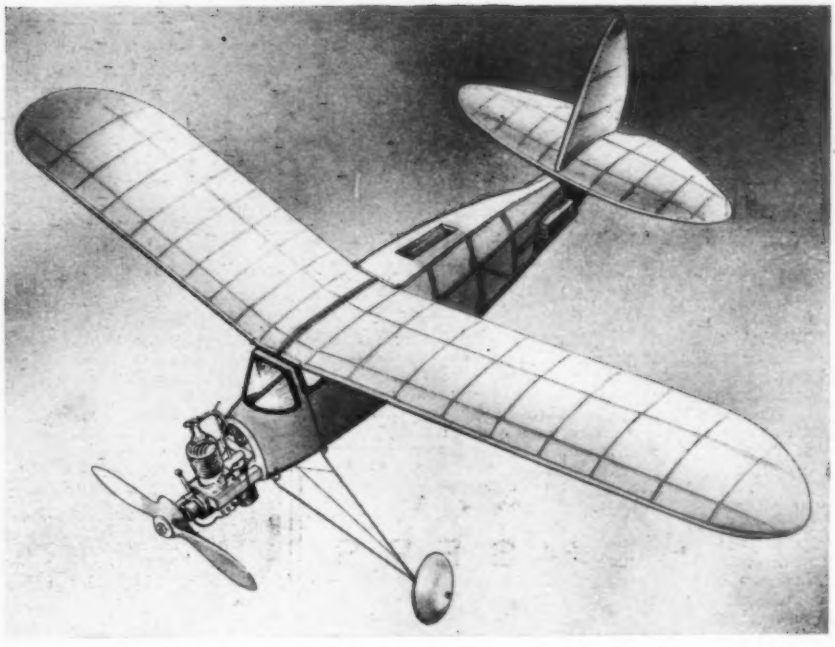
THE first series of serious flight tests of the twin-engined Altair monoplane, which was illustrated in *Flight* of August 4, have been completed. These tests consisted principally of a series of take-offs and landings which were made in order to use the maximum available range of power over short intervals. According to the test pilot, Mr. Downes, the two coupled engines produced their 580 h.p. maximum without giving the trouble which might possibly have been expected from the gear or clutch.

The power unit concerned consists of two inverted Menascos geared to a single airscrew, and the scheme has been developed by the Vega Airplane Company, a subsidiary of the Lockheed Corporation, with the idea of providing all the safety features of twin-engine power with the simplicity of single-engine installation. Needless to say, this simplicity means that the single-engine performance should be very much more useful when the failing unit has been declutched. The "Unitwin" power plant will shortly be applied to a more modern aircraft than the Altair.

ABOUT AUSTRALIA

THE articles by H. F. King, of the staff of *Flight*, on military aviation and other subjects are well known to our readers. Mr. King has recently returned from a flying visit to Australia, a journey undertaken with the object of studying the Empire Air Route, the operation and equipment of the Royal Australian Air Force and the present state of commercial aviation in the Commonwealth.

In the near future the writer will record his impressions in a series of special *Flight* articles. It is often difficult to obtain unbiased information from far-distant parts of the world, and these first-hand accounts should prove valuable.



Mr. E. Ross's little petrol model, described on this page, has a 2.5 c.c. engine.

MODELS

The Wakefield Cup: A Small Petrol Model: More Records

By M. R. KNIGHT

America Wins the Wakefield Cup

THE 1938 contest for the Wakefield Cup—principal trophy of the model flying movement—has been won by America. Mr. J. Cahill's high-wing model remained aloft for 33 minutes, thereby securing the highest individual average of the day.

The winning machine had a typically American wing—of constant chord and "undihedralled" for about one-third of the span, with elliptical tips set at a dihedral angle of about 13 degrees. The most interesting feature, however, was the single-bladed airscrew, which automatically folded when the power ceased. While allowing for the effect of retraction on the gliding and soaring capabilities, it is not unfair to say that the model found the right thermal, for less than one minute of its flight was accounted for by length of motor run. Thus exceptional weather conditions have again conspired to defeat the object of the revised minimum weight rule, namely, the reduction or elimination of the chance element in contests.

The British team's efforts were far more meritorious than might appear from the final placings. Many people feel that the Wakefield contest should be decided, not on the basis of the best individual average, but on the team average. Had this been the case, the cup would have been ours.

The following account of the proceedings at Guyancourt, in France, is contributed by a correspondent.

"The Wakefield contest has become truly international. In 1936, when Great Britain retrieved the cup from America, there were six countries represented, last year there were 11, while this year teams from 14 nations met at the Caudron Aerodrome, Guyancourt. The preliminary weighing and measuring of models was expeditiously carried out in a hall of the French Aero Club, after which lots were drawn for the order of flying.

"On the day of the contest, July 31, there were thermals in abundance, a complete absence of wind, and at times a temperature of about 100 degrees. The first outstanding flight was made by Mr. E. Chasteneuf, of Great Britain. His shoulder-wing model continued to climb steadily long after the power ceased, and was timed for 10 min. "out of sight." The same thermal enabled Mr. Milligan's Canadian model, flown by a British 'pilot,' to clock 11 min. There followed a 9½-min. flight by Mr. R. Smith, of Great Britain, a 17-min. flight by a Swedish model, and the 33-min. flight which gave Mr. Cahill the victory.

"Mr. R. N. Bullock (Great Britain) was unable to complete his flights, as his magnificent shoulder-wing model was lost after soaring for 8 minutes at a great height right over the aerodrome. Mr. L. Stott, of Great Britain, was similarly handicapped, though his model was found after the contest closed. Second and third places went to France, fourth to Sweden, and fifth to Germany. Messrs. F. J. Almond, E. Chasteneuf, R. N. Bullock and R. Smith secured respectively for Great Britain sixth, eighth, ninth and fourteenth places. The remaining member of the team, Mr. H. White, also flew well. Despite the loss of two models, the British team secured the best team average.

"The countries competing were America, France, Sweden, Germany, Great Britain, Australia, Belgium, Canada, Czechoslovakia, Holland, Norway, Poland, South Africa and Switzerland. The cup was presented to the winning team by Mme. Wibault, wife of the well-known aeroplane constructor, and president of the Comité Français des Modèles Réduits d'Avions, in the presence of the French Air Minister, at a banquet given at the Palais d'Orsay."

A "Vest-pocket" Petrol Model

A FEW years ago the smallest petrol engine available for model aeroplanes was of 30 c.c. capacity, involving a cumbersome model of about 15ft. wing-span. The growing popularity of petrol models is largely the result of the production of reliable power units of from 6 to 9 c.c., allowing of a handier size of model.

Mr. E. Ross, of the Essex Power M.A.C., has recently designed a petrol model of wellnigh "vest-pocket" dimensions, which can easily be transported to the flying field in a public vehicle. Appropriately named "Ma Petite Bébé," it is in effect a Wakefield class machine, having 208 sq. in. of wing area, and weighing without motor only 6 oz. In place of 2 oz. of rubber, it has a 2.5 c.c. Trojan two-stroke, which is in itself of considerable interest. It is fitted with a deflectorless flat-top piston without rings, and the main shaft runs in a small ball-race. The whole of the crankshaft and timing assembly is mounted on a casting which screws as a complete unit into the front of the crankcase. It is mounted on two basswood runners, $\frac{3}{8}$in. x $\frac{3}{8}$in., built into the first two fuselage bulkheads. It runs perfectly, and turns a 9-in. airscrew at a very high speed.

The constructional system of "Ma Petite Bébé" broadly resembles that of the "Southern Star" described last month. With the exception of basswood runners and balsa ribs, the material used throughout is small-section spruce, which nowhere exceeds $\frac{1}{4}$in x $\frac{1}{4}$in. The 40-in. tapered cantilever wing is in two parts, which plug together by means of $\frac{1}{4}$in. birch dowels. It has two main spars of $\frac{1}{8}$in. x $\frac{1}{16}$in spruce, a leading edge of $\frac{1}{4}$in. x $\frac{1}{8}$in., and a trailing edge of $\frac{1}{4}$in. x $\frac{3}{32}$in. The section is Clark Y, and the dihedral angle 10 deg. Measured from the datum-line there are 1½ deg. of incidence, and from the thrust-line 3½ deg. The tail-plane has a cambered top surface, but is flat underneath. Its chord-line is coincident with the thrust-line. The silk covering of the model is proofed with two coats of clear dope, and one of Cellon orange, in which livery it looks very snappy indeed.

The total weight is 20 oz., and the wing-loading 14 oz. per sq. ft., but an appreciable reduction should result from further experimentation with coils and batteries. The glide is fast, but very flat, and the stability entirely satisfactory.

(*Continued overleaf.*)

A flight of 6 min. 54 sec. secured for Mr. A. H. Lee (Bristol W.M.A.C.) the seaplane and biplane rise-off-water records.

* * *

The flying-boat record has been raised to 22 sec. by Mr. H. S. Sayers (North Kent M.A.S.) with the tapered-wing twin-motor model mentioned last month.

* * *

The tremendous reputation achieved by Frank Zaic's *Model Aeronautics Year Book* will undoubtedly be enhanced by the 1938 edition. While the price remains at 4s., the number of pages has risen from 160 to 190, and to some purpose. The designs of successful models include 1937 Wakefield types from France, Great Britain, America, Holland, Belgium and Sweden. Also, by virtue of winning the Moffet Trophy, the American winner of this year's Wakefield! Petrol and indoor models and gliders are not neglected. There are also chapters on low-speed aerodynamics, propeller theory, single-bladed airscrews, stability, aerofoils and radio control. This invaluable book is obtainable from model aircraft stores. Trade enquiries can be forwarded.

THE INDUSTRY

The Ill Wind

NOWADAYS the Croydon shops of Rollason Aircraft Services are busier than ever on various types of military sub-contract and other work. So much so that the main hangar was recently partitioned off from the outer world and guarded strictly by an experienced spy-hunter, who without hesitation removes one's camera before entering.

However, the shops have still been busy on civil work, mainly in connection with Gipsy engine overhaul and with certain C. of A. modifications to Czechoslovakian Praga engines, which will duly be refitted to certificated Hillson monoplanes in Manchester and elsewhere. Presumably future Praga engines will be suitably modified before importation into this country, particularly now that the C.A.G. scheme is getting into its swing.

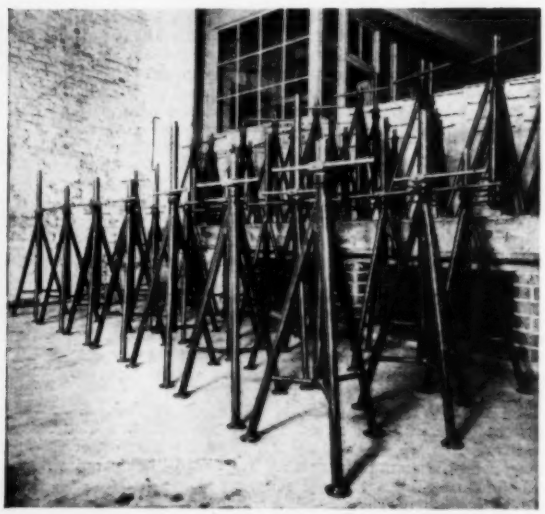
For the time being, and until the military emergency is no longer so vital, Rollason's Hanworth shops are handling practically all the civil airframe work, and these shops are busy enough.

Air-compressor Plant

A NEW air compressor, of unusually neat design and of rather smaller size than those previously made by the company, is described in a catalogue recently issued by J. Browett Lindley (1931), Ltd., of Coborn Works, Dunham's Lane, Letchworth, Herts

Softening the Blow

THERE are any number of instances in aircraft manufacture and maintenance when fairly heavy hammer blows must be struck without risk of damaging materials. For such jobs as these the products of the Thor Hammer Co., of 94, Snow Hill, Birmingham, 4, are specially designed. The latest Thor hammer is a finely produced tool having a double-ended head—soft copper at one end and rawhide at the other. These faces are renewable. Three sizes are made, ¾lb., 1¼lb. and 2¼lb., and prices are 2s. 2d., 2s. 11d. and 3s. 8d. respectively.



AIRCRAFT JACKS made by Brown Brothers, Ltd.—a consignment for a well-known manufacturer of military aircraft. The jacks, which are also used in the R.A.F., are employed for lifting aircraft for undercarriage maintenance and similar work.

BAKELITE SECTIONS: Retaining, it is stated, all the qualities of the maker's well-known laminated sheet, shaped sections of laminated Bakelite are now available in a variety of channel and corrugated forms which should find a number of uses in aircraft structures. Details are available from Bakelite, Ltd., 68, Victoria Street, London, S.W.1.

Speed on Land

JOHN MARSTON, LTD., a subsidiary of Imperial Chemical Industries, played an important part in preparing Captain George Eyston's *Thunderbolt* for its successful attack on the world's land speed record. They redesigned and rebuilt the aluminium body and made the Perspex-enclosed cockpit, while fairings, tanks and many other items were Marston products.

The two Rolls-Royce engines carried 48 Lodge sparking plugs, and Shell fuel and Castrol oil were used.

AERONAUTICAL PATENT SPECIFICATIONS

(The numbers in brackets are those under which the Specifications will be printed and abridged, etc.)

(*Published August* 25, 1938)

2293. ELLOR, J. E.: Fuel tanks for aircraft (489,611).
2556. BECHEREAU, L., and CARROULL, R.: Hydraulic vibration-dampers mounted on aircraft (489,618).
3351. WILLOUGHBY, P. N., and WILLOUGHBY DELTA CO., LTD.: Retractable undercarriages for aircraft (489,385).
5633. BOULTON PAUL AIRCRAFT, LTD., and HUGHES, H. A.: Retracting undercarriage for aircraft (489,391).
5634. BOULTON PAUL AIRCRAFT, LTD., and CLARKE, W. H. V.: Method of and and means for operating trimming and/or balancing flaps on the control surfaces of aircraft (489,392).
5982. DOWTY, G. H.: Device for measuring ground speeds or distances in connection with aircraft (489,514).
9792. DE HAVILLAND AIRCRAFT CO., LTD., and THOMAS, F. M.: Securing of airscrew blades (489,400).
31789. MERCIER, P. E.: Cowling for aircraft engines or radiators (489,594).
330. DEUTSCHE WERKE KIEL AKT.-GES., and HOLLMANN, E.: Controlling means for aircraft catapults (489,417).
9283. ASBOTH HELICOPTERS, LTD., and ASBOTH, O. DE: Rotary wing aircraft (489,420).

(*Published September* 1, 1938)

2525. UNITED AIRCRAFT CORPORATION: Aeronautical propellers (489,648).
2826. HEINE, H.: Means for protecting wooden airscrew blades (480,002).
2828. HEINE, H. (Trading as HEINE MOBELFABRIK, PROPELLERWERK, H.): Glueing synthetic rubber (489,764).
3228. MILES, F. G.: Fluid pressure jacks, particularly for aircraft flap or like control (489,771).
3229. MILES, F. G.: Aerofoils (489,853).
3599. BRISTOL AEROPLANE CO., LTD., FRISE, L. G. and MORGAN, W. G.: Fuel-tanks for aircraft (489,950).
3716. WILLIAMS, G. H. KREASEL: Ships for carrying aircraft (489,960).
7761. HEATLY, W. G.: Navigational instrument azimuth circles (489,741).
20942. JAEGER-AVIATION: Method of navigation particularly applicable to aeria navigation and means for carrying it out (489,811).
28312. SHEVLIN, J. T. (Siemens Apparate und Maschinen Ges.): Automatic control apparatus for vehicles, in particular aircraft (489,908).
30845. JUNKERS FLUGZEUG-UND-MOTORENWERKE AKT.-GES.: Apparatus for carrying loads adapted to be launched from aircraft (489,983).
1815. OESTERREICHISCHE UNGARISCHE OPTISCHE ANSTALT C. P. GOERZ GES., and PETSCHENIG, K.: Devices for determining the elements of the path of aircraft (489,687).
13257. SHORT BROS. (ROCHESTER AND BEDFORD) LTD., and GOUGE, A.: Bomb carrying and dropping apparatus for use on aircraft (490,027).